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MODERN EXPERIENCE IN BACTERIAL MENINGITIS*

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INTEREST in meningitis has increased greatly in recent years because of the new drugs available for treatment and the consequent progressive lowering in mortality. For the purpose of the present discussion, all cases of meningitis admitted to the Toronto General Hospital from 1947-56 inclusive were surveyed to assess the frequency of the different types in hospital practice and also to evaluate the effectiveness of treatment. During this 10-year period, 219 cases of meningitis were admitted to the hospital. Fifty-nine of these (27%) were cases of aseptic meningitis, presumably all of viral origin. Recovery took place in all these instances with symptomatic treatment only. This paper will be confined to the remaining 160 cases which were of bacterial or mycotic origin.

SPECIFIC DIAGNOSIS

Table I shows the breakdown of the bacterial and mycotic cases. It will be noted that pneumococcal meningitis was by far the commonest, with tuberculous meningitis next in frequency and staphylococcal meningitis a poor third. Thus in this hospital, pneumococcal and tuberculous meningitis together constituted more than 50% of the cases. The infrequency of meningococcal meningitis was surprising but may be explained by the fact that this hospital is limited to adults. Confirmation of the type of meningitis depended on finding one or more of the following: a positive culture from the blood or cerebrospinal fluid, definite identification of the organism on smear of the cerebrospinal fluid, autopsy verification, or, in some cases of tuberculous meningitis, a positive result from guinea-pig inoculation. It will be observed that there were 43 cases in which confirmation was not obtained but in 10 of these there was sufficient evidence from the clinical course of the disease, the findings in the cerebrospinal fluid, the response to the treatment used and in some instances from the results on culture of material obtained outside the central nervous system to make a reasonable identification of the responsible organism. In the remaining 33 cases there was no definite evidence as to the causative organism, although one could often be suspected from the circumstances under which the meningitis developed and the course of the illness.

TABLE I.—BACTERIAL AND MYCOTIC MENINGITIS
TORONTO GENERAL HOSPITAL, 1947-1956

Organism	*Confirmed*	*Unconfirmed*
Pneumococcus	46	2
Tubercle bacillus	34	5
Staphylococcus	12	2
Coliform organisms	7	0
Meningococcus	5	0
H. influenzæ	4	1
Streptococcus	3	0
Friedländer's bacillus	2	0
Listeria monocytogenes	2	0
Torula histolytica	1	0
Actinomyces	1	0
Unknown organisms	0	33
	117	43

TABLE II.—BACTERIAL AND MYCOTIC MENINGITIS
TORONTO GENERAL HOSPITAL, 1947-1956

Organism	*No source identified*	*Source identified*
Pneumococcus	6	42
Tubercle bacillus	10	29
Staphylococcus	0	14
Coliform organisms	0	7
Meningococcus	5	0
H. influenzæ	4	1
Streptococcus	0	3
Friedländer's bacillus	0	2
Listeria monocytogenes	2	0
Torula histolytica	1	0
Actinomyces	1	0
Unknown organisms	12	21
	41	119

In a high proportion of the cases a primary source for the infection was detected (Table II). Thus in the pneumococcal cases, evidence of primary infection was found in all but six, and of these, three were chronic alcoholics. Pneumonia was present in 21, chronic otitis media in 12, sinusitis in six, and in three cases the meningitis followed a craniocerebral injury. There were 10 cases of tuberculous meningitis in which no primary

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lesion was discovered clinically, and in three that came to autopsy the primary lesion remained undetected. All the cases of staphylococcal, coliform, streptococcal and Friedländer-bacillus meningitis had primary sources of infection. The organisms were introduced by surgical procedures on the skull or elsewhere in eight, followed traumatic injuries to the skull in two, and were associated with infections of ears, sinuses, lungs, kidneys, skin, etc., in the remainder. Among the 33 cases in which the organism was not identified 21 were secondary. In eight of these the meningitis followed craniotomy and thus was probably staphylococcal in all eight. In five it followed a craniocerebral injury and was most likely due to the pneumococcus or the *H. influenzæ* bacillus. In seven it followed chronic otitis media and in one a sinusitis, so that in these eight cases either a pneumococcus, *H. influenzæ* or a streptococcus could have been the causative organism. The 12 cases which appeared to develop spontaneously might have been caused by a meningococcus, a pneumococcus or *H. influenzæ*.

A significant number of the patients in whom the organism could not be identified or grown on culture had received antibiotic therapy before the cerebrospinal fluid was examined. The importance of withholding antibiotic therapy until cultures from the blood and cerebrospinal fluid as well as smears from the cerebrospinal fluid have been obtained cannot be stressed too strongly, since otherwise the chances for identifying the organism become greatly reduced. Furthermore, even if the antibiotic used happens to be appropriate, the dosage may be inadequate, thus favouring increased resistance of the organism to the particular drug and rendering subsequent administration of a massive dosage of this drug ineffective. Physicians should always remain alert to the possibility of septic meningitis whenever headache and an unexplained fever are encountered. The importance of carrying out a lumbar puncture in such cases before giving antibiotic therapy must be emphasized.

TREATMENT

The results of treatment in these 160 cases of meningitis show a total recovery rate of about 50% (Table III). This is not an entirely true picture since the results have been much better in the last five years of the survey than they were in the first five years, owing to increasing improvement in available drug therapy. Pneumococcal meningitis had a recovery rate of 50%. In general, cases secondary to middle ear and sinus infection did better than those with primary pneumonia or with no recognized source. The recent use of massive doses of penicillin, such as one million units intramuscularly 2-hourly, in addition to sulfadiazine intravenously or intramuscularly lowered the mortality rate appreciably in the last five years of the survey. Opinion is now divided about the necessity of using intrathecal penicillin. Most of these patients received it in doses of 20,000 units in saline daily for several days. Since penicillin by other routes may not be active in the cerebrospinal fluid for eight to 12 hours, it should probably be given intrathecally on the first day of treatment at least.

TABLE III.—BACTERIAL AND MYCOTIC MENINGITIS
TORONTO GENERAL HOSPITAL, 1947-1956

Organism	*Survived*	*Fatal*
Pneumococcus	24	24
Tubercle bacillus	10	29
Staphylococcus	7	7
Coliform organism	2	5
Meningococcus	4	1
H. influenzæ	4	1
Streptococcus	2	1
Friedländer's bacillus	0	2
Listeria monocytogenes	1	1
Torula histolytica	0	1
Actinomyces	1	0
Unknown organisms	23	10
	78	82

In tuberculous meningitis there was only a 25% recovery rate. Analysis of the 39 cases indicates that between 1947 and 1951 there were 18 with one survivor (5% recovery). These patients received only streptomycin intramuscularly, intrathecally and in a few instances intraventricularly as well. In 1952, para-aminosalicylic acid was added to the therapy and shortly afterwards isoniazid came into use. Between 1952 and 1956, there were 21 cases with 9 survivors (43% recovery). The significant improvement in mortality rate since 1953 can be attributed mainly to isoniazid, which is by far the most effective agent against the tubercle bacillus. Where there is any reason to believe that hydrocephalus may be developing or improvement is unsatisfactory, we now use steroid therapy as well. The question whether to continue using intrathecal streptomycin is still unsettled. It is neurotoxic and probably not necessary while isoniazid is available but since it has not been proven to be of no value, some physicians continue to administer it, although less frequently and for shorter periods than formerly. Personally I no longer use intrathecal therapy.

The 50% recovery rate in staphylococcal meningitis in this series is quite good. Most of the patients were treated with penicillin and sulfonamides, as for pneumococcal meningitis. However, the staphylococcus is often resistant to penicillin, particularly when the infection is acquired in hospital. In this event, bacitracin may be substituted and given intramuscularly and intrathecally. It is preferable not to use bacitracin, primarily because it may be nephrotoxic in high dosage. When infection is acquired in hospital and while sensitivity tests are being awaited, a combination of chloramphenicol (Chloromycetin) or erythromycin with one of the newer anti-staphylococcal agents has been recommended as better than the more commonly used streptomycin or

aureomycin, to which the organism may be resistant. If the infection is contracted away from hospital, penicillin and a sulfonamide can be administered until the results of the sensitivity tests are available. Treatment should be continued for 10 days after symptoms and signs have subsided, because recurrences have been recorded up to 4-6 weeks.

Space will not permit any detailed consideration of treatment in the other less common types of meningitis. I would like to draw attention however to the surprisingly high recovery rate (70%) in the 33 cases in which the organism was not identified. A review of these shows that penicillin was administered intramuscularly in all, together with sulfonamides in many and streptomycin in a few. Rarely, some other antibiotic was employed as well. As mentioned previously, in such cases the circumstances under which the meningitis develops may provide a clue as to the nature of the responsible organism but the inability to carry out sensitivity studies is a great handicap in treatment. However, the combination of penicillin and streptomycin with a sulfonamide gives broad coverage.

I will omit discussion of the general management of the patient with septic meningitis which would include symptomatic and supportive measures, except to state that all cases should be admitted to hospital immediately the diagnosis is suspected. This is advised not only because of the seriousness of the disease and the need for adequate nursing attention, but also because proper care of the patient will require laboratory facilities and full-time attention from the resident physicians. An important surgical feature in the treatment of purulent meningitis is the drainage or eradication of any focus acting as a feeder and existing in sinuses, middle ears, mastoid sites or elsewhere. This should be done as early as the patient's condition will permit.

SUMMARY

During a 10-year period, 1947-1956, 219 cases of meningitis were treated in the Toronto General Hospital. Fifty-nine were cases of aseptic meningitis and the remaining 160 were of bacterial and mycotic origin.

In the latter group, pneumococcal meningitis was the commonest form, with tuberculous meningitis next in frequency. Together they accounted for well over 50% of the cases. In 33 cases the responsible organism could not be identified; this could be attributed in many instances to the administration of antibiotic therapy before cultures had been taken and a smear from the cerebrospinal fluid had been examined.

The over-all recovery rate was only about 50% but the mortality rate had been progressively reduced in the last few years of the survey owing to improved forms of drug therapy which became available.

The drug therapy of the more common types of septic meningitis is discussed. Surgically accessible infections involving the ears or sinuses are present in an appreciable number of cases of purulent meningitis. These sources should be drained or eradicated as soon as the patient's condition permits.

RÉSUMÉ

Des 219 cas de méningite traités à l'Hôpital Général de Toronto entre 1947 et 1956, 59 appartenaient au groupe dit "aseptique", alors que les 160 autres étaient d'origine bactérienne ou mycotique. Les méningites à pneumocoques et à B.K. venaient en tête. Dans 33 cas, le microorganisme ne put être identifié, souvent en raison de l'influence des antibiotiques qui en avaient modifié les caractéristiques. Le taux de mortalité en général fut de 50% quoiqu'on observa récemment un déclin attribuable sans doute à l'introduction dans la thérapie de nouveaux médicaments. L'auteur s'étend quelque peu sur ce sujet. Les foyers d'infection accessibles à la chirurgie constituent une cause appréciable de méningite purulente; ils doivent être supprimés aussitôt que l'état général du malade le permet.

MENINGITIS: SOME SURGICAL CONSIDERATIONS
WITH PARTICULAR REFERENCE TO PETROUS FRACTURES*

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IN THE SYMPOSIUM on bacterial meningitis at the joint meeting of the British and Canadian Medical Associations in Edinburgh for which this paper was prepared, only a few isolated items on the surgical aspects of meningitis could be picked out for consideration. These points are reproduced here in a somewhat fuller form. An informative and considered review of the broad subject of meningitis from the neurosurgical standpoint can be found in Johnson's article[1] in *British Surgical Practice* (1958).

Much of a surgeon's experience with meningitis derives from the treatment of head trauma. Intracranial abscess and empyema remain an important field, though with the better treatment of primary infective foci, both distant and adjacent, the number of patients with intracranial suppuration who pass through a general neurosurgical service is diminishing. Apart then from cerebral and cerebellar abscess and subdural empyema from now well-recognized sources, the types of bacterial meningitis that concern the surgeon are those that follow head injury and those that occur post-

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operatively, often in previously non-infective cases, as the result of contamination from antibiotic-resistant organisms.

Petrous Fractures

In a study[2] from the Toronto General Hospital of fractures involving the paranasal air sinuses and petrous cavities it was remarked that comparatively little attention had been paid in the literature to the influence of petrous fractures on the incidence of traumatic meningitis. This particular question has been considered by Grove[3] in the course of an extensive article on the otoneurology of head injury. To the neurosurgeon convinced of the danger of meningitis from cerebrospinal fluid (CSF) rhinorrhœa, such statements in that article as "I have seen no fatalities in cases exhibiting a discharge of spinal fluid [from the ear] and none of these cases were operated upon" seem provocative. How do basal fractures involving the paranasal air sinuses and the overlying dura differ in their liability to complication by meningitis from fractures involving the cavities in the petrous bone? This question must be answered if we wish to infer from Grove's remarks that traumatic CSF otorrhœa is not dangerous and does not predispose to meningitis. Again, "I do not believe that the escape of cerebrospinal fluid from the ear makes the prognosis any worse than the escape of blood does as long as the functional tests indicate no labyrinthine fracture." To take a final quotation: ". . . the indications for operative interference are the same whether the post-traumatic ear discharge is cerebrospinal fluid or blood. There is absolutely no reason for operating on an ear which discharges cerebrospinal fluid after a longitudinal fracture unless ear suppuration sets in and in that case a simple mastoid operation will probably suffice to produce adequate drainage." It should be noted that Grove writes as an otologist and when he says that no operation should be undertaken he refers to endaural procedures such as mastoidectomy. Nevertheless he gives no consideration to procedures designed to stop the flow of CSF by intracranial repair of the dural defect.

Since these statements are so uncompromising, the whole question will be examined in the light of our experience at the Toronto General Hospital Neurosurgical Division over a 10-year period (1949-1958).

During this time there were 693 admissions to hospital in which a final diagnosis of skull fracture was made. Of these, 117 (15%) had evidence of petrous fracture either from roentgenograms, the finding of blood in the external ear canal or medial to the drum, CSF otorrhœa or meningitis (in the absence of anterior fossa fracture). Only in five instances of the cases of petrous fracture was meningitis found related to the injury either immediately or later. These will be briefly summarized.

CASE 1 (D 26381).—L.F., girl, aged 14. When aged 5 she sustained a fracture involving the left mastoid. Eight years later she developed acute otitis media in the left ear complicated at the onset by meningitis. The tympanic membrane was intact and not scarred and there had been no aural discharge in the years between her head injury and attack of meningitis. The otitis media and meningitis quickly responded to antibiotic therapy. The infecting organism was a pneumococcus which was isolated from the CSF. Six months later an intradural exploration of the middle cranial fossa was carried out (by Dr. E. H. Botterell) and a defect about 1 cm. in diameter was found in the tegmen tympani with a larger defect in the dura mater overlying it. The defect was patched with fascia lata and the patient made a good recovery and has remained well (follow-up seven years).

CASE 2 (C 11428).—F.V., man, aged 24. Head injury produced a left temporal compound depressed fracture, perforated tympanic membrane and extrusion of cerebral tissue from the external canal. The skin wound and depressed fracture were attended to and the patient made a satisfactory recovery. Six months later a temporo-parietal tantalum cranioplasty was performed to cover a large skull defect. Seven years later, infection about the plate necessitated its removal. At the time, it was presumed that the infection had occurred in a scalp hæmatoma, since three large dents were seen in the plate when it was removed. A pneumococcus was isolated from the pus. Four months later the patient was re-admitted, having remained well in the meantime, with CSF otorrhœa and meningitis. A middle fossa intradural craniotomy revealed a defect through the tegmen tympani to which a funnel of pia arachnoid was adherent; pus was found in the immediate vicinity. The defect was patched with fascia lata but the patient had already suffered irreversible damage from the meningitis and he remained in coma until his death four months later. At necropsy, the fascial patch which had been inserted in the presence of active infection was found to be firmly adherent to the dura overlying the petrous bone and had become an effective dural substitute without undergoing necrosis.

CASE 3 (D 13357).—H.K., man, aged 23. After injury, x-ray examination revealed a linear fracture running down from the temporal squame to the region of the middle ear. Pneumocephalus was diagnosed from these films and CSF was seen escaping from the ear. Massive chemotherapy and antibiotic therapy (streptomycin and penicillin) were administered, but six days later meningitis became established and an atypical coliform organism (*B. coli anaerogenes*?) was grown from the CSF. *In vitro* the organism was resistant to 100 μg./c.c. of streptomycin but sensitive to less than 0.39 μg./c.c. of aureomycin. The infection was then successfully brought under control with aureomycin. Three months later the patient was re-admitted to hospital because he had, for the first time in his life, a chronic purulent aural discharge from the side involved in the fracture. A radical mastoidectomy was performed (by Dr. D. P. Bryce) from which the patient recovered uneventfully and the ear was dry in three months. At operation it was noted that the bone was extremely cellular "and the mastoid antrum was found to be full of granulations and infected.

Signs of previous fracture were noted running vertically through the temporal bone from the antrum and there was a large dural exposure just lateral to the antrum." The dura was found to be intact.

CASE 4 (C 84141).—D.L., boy, aged 14. A blow to the head resulted in a radiologically demonstrable vertical fracture line through the right petrous pyramid; the line ran medial to the right vestibular apparatus. There was total loss of labyrinth and cochlear function. Four days after injury and while being given 400,000 units of penicillin intramuscularly daily he developed meningitis. A few colonies of *H. influenzæ* were grown from the CSF. The meningitis was brought under control with chemotherapy. Three weeks later an intradural exploration of the middle cranial fossa was carried out but no dural defect or other abnormality was found. Since that time he has remained free from meningitis and aural discharge (follow-up three years).

CASE 5 (E 19090).—R.J., aged 16. Motorcycle accident. On admission a linear fracture in the left temporal bone was seen when exploratory burr holes were being made for a possible surface clot. The left ear was bleeding freely but then gave place to a watery, blood-stained discharge which was copious at first and believed to be CSF. Three weeks after the injury he developed meningitis, and *B. coli* was grown from the CSF. The meningitis was brought under control with chloramphenicol (Chloromycetin) intramuscularly, and the otorrhœa gradually subsided. No aural or intracranial exploration was undertaken and the patient has remained free from meningitis and aural discharge (follow-up two years).

Comment.—Cases 1 and 2 are examples of fractures of the middle ear with tearing of the overlying dura resulting in meningitis whose onset was delayed for years. Meningitis occurred as a consequence of active middle ear infection. In Case 3, meningitis complicated traumatic CSF otorrhœa and pneumocephalus but three months later at operation through the ear the dura appeared intact. It is possible that, had an intradural exploration been carried out, a dural defect might have been found; it is the experience of neurosurgeons generally that anterior fossa traumatic dural defects may be overlooked if exploration is undertaken extradurally. The same applies to defects related to the petrous bone. This is not to say that this case should have been managed otherwise. On the contrary, chronic infection was present in the ear and had to be eradicated; when this was done the patient remained well. In Case 4, meningitis developed after injury in the absence of any external or tympanic membrane injury, and there was no demonstrable dural tear in the middle fossa. It may be that a fracture that had escaped detection was present in the anterior cranial fossa and by involving a paranasal air sinus gave rise to meningitis. Or the petrous fracture may have torn the dura on the posterior fossa aspect of the petrous bone and established a connection between the subarachnoid space and the pharynx via the eustachian tube. The few case reports in the literature of such a fistula, whether post-traumatic or following the removal of an acoustic neuroma, (Ghouralal,[4] Ecker,[5] McKenzie,[6] Walker[7]) where the drum was intact have presented with CSF discharging from the nose. One may, however, presume that a eustachian fistula would not declare itself in this way but merely conduct the CSF down the pharynx undetected, particularly if the patency of the fistula is short-lived.

Case 5 shows that meningitis after traumatic CSF rhinorrhœa does not necessarily recur after spontaneous healing of the CSF fistula and in the absence of ear infection. But many more similar cases need to be studied and followed up before any complacent generalizations are made.

Diagnosis of CSF otorrhœa.—As with CSF rhinorrhœa, it may be very difficult to prove that the collected fluid is CSF because of its contamination with blood or serum. And as the flow of blood or serum dries up, the CSF otorrhœa too may stop. Because of this contamination, attempts at detection of CSF by chemical analysis may be valueless. It is possible to confirm by laboratory methods that the fluid is CSF in those patients with copious flow in which its identity is obvious to the naked eye, but in the more frequent instances of transient contaminated flow of small or moderate quantity, a helpful method of analysis has yet to be devised. It should therefore be borne in mind that of the cases in this series that were thought to have had CSF otorrhœa (a total of 20) some may have been discharging merely serum from the meatus.

The following conclusions therefore are drawn:

1. Petrous fractures uncommonly give rise to meningitis (approximately 5%).

2. The presence of CSF otorrhœa, copious or slight (if it can be identified beyond doubt, which in the latter case is usually difficult), transient or persistent, is dangerous and the fistula should be sealed by intracranial operation and repair of the dural defect.

3. Acute or chronic suppurative otitis media is more likely to lead to meningitis if the petrous bone has previously been the site of fracture and if at the time of injury the dura mater related to the fracture has been torn.

Conclusions 2 and 3 clearly cannot be based solely on this small series of cases although the examples cited earlier support them. They are, however, also based on neurosurgical principles that the writer sees no reason to reject in the special type of case under consideration.

Negative intracranial explorations.—On four occasions intradural middle fossa exploration for CSF otorrhœa was carried out without finding a dural tear. Fortunately, the operation is by no means a formidable one and carries no disability with it, but even so, the fact that it continues to be performed despite as many negative explorations as positive ones reveals the respect with which the neurosurgeon regards CSF otorrhœa.

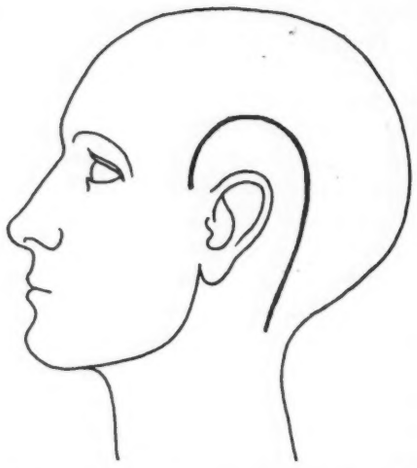

Fig. 1.—Skin incision for combined middle and posterior fossa approach to petrous bone.

Combined middle and posterior fossa exploration.—"It is very rarely necessary for the surgeon to have to explore the posterior fossa in order to stop an aural leak [of CSF]," Shortman and Smith[8] point out in an article describing a case of traumatic CSF otorrhœa which had given rise to meningitis and serious salt depletion. I agree with this statement, but in cases of CSF otorrhœa requiring intracranial exploration the surgeon should be prepared to open the posterior cranial fossa at the same operation if a dural tear is not found in the middle fossa. The procedure adds little to the time or severity of the operation provided the possible necessity for it is anticipated by preparing, positioning and draping the patient appropriately.

CASE 6 (D 88674).—G.W., man, aged 24. A severe head injury was followed by CSF otorrhœa that stopped after eight days. A delayed facial palsy and disturbance of consciousness for two weeks also complicated the injury. Five weeks after the injury, by which time the tympanic membrane had healed, operation was undertaken and an incision was planned that would allow access to both the middle and posterior fossæ (Fig. 1). Through a small temporal craniectomy the dura of the middle fossa was found to be normal, and the skin incision was extended to allow access to the lateral part of the occipital squame. The posterior aspect of the petrous bone was examined intradurally and an oval dural defect, measuring 1.0 × 0.5 cm., was seen which exposed the separated edges of a vertical fracture into which CSF was freely seeping. The defect was situated half way between the sigmoid sinus and the opening of the internal auditory meatus. A graft of fascia lata was laid over the defect and was held in place by the cerebellum as soon as the retractor was removed. The patient has remained well during the 3½ years since operation.

Although the flow of CSF from the ear in this case had stopped, exploration was undertaken because the flow had been copious. The ease with which CSF had escaped from the ear was taken to indicate that the dural defect was large and that the separation between the fractured edges of bone was considerable. Both these conjectures were found to be true. Furthermore it has been shown[3] that bony union does not occur at all readily after basal skull fractures and it is known that dura mater (or fascia lata graft) is the only effective barrier to the passage of infection from air sinuses to the subarachnoid space; scar tissue itself is inadequate. There is also evidence that the mastoid air cells and the middle ear cavity are prone to infection if they are constantly infused with CSF even though the tympanic membrane is intact. This evidence is taken from the experience of numerous surgeons (including the writer) who have by-passed an obstruction to the flow of CSF from the ventricles to the subarachnoid space by placing a fine tube from the lateral ventricle to the mastoid air cells. Sooner or later meningitis supervenes, even though the ear has previously been healthy and has not become the seat of acute otitis.

Ps. Pyocyanea Meningitis: A Consequence of Prophylactic Antibiotic Therapy

Antibiotic therapy may have other effects than that of creating resistant organisms, as the following illustration shows.

CASE 7 (E 44881).—K.B., woman, aged 20. She sustained a very severe compound frontal wound with extensive frontal comminution and crumpling of the anterior fossa floor with dural tears related to fractures of the paranasal air sinuses. Wound débridement was carried out and skin closure obtained; repair by fascia lata of the anterior fossa floor was delayed until her condition had improved and the brain swelling and contusion had settled down. During this waiting period heavy doses of penicillin, chloramphenicol and erythromycin were given. On the 16th day (see Fig. 2) she developed meningitis due to *Ps. pyocyanea* which was only with difficulty brought under control with polymyxin B intramuscularly (25 mg. increasing to 37.5 mg., intramuscularly, 6-hourly, for 12 days) and intrathecally (2.5 mg. daily for 60 days); to this was added sulfadiazine and tetracycline until the CSF white cell count fell below 100/c.mm.

Comment.—The elimination or reduction by antibiotics of the normal flora of the nasopharynx created an environment favourable to the proliferation of *Ps. pyocyanea,* an exceedingly dangerous organism. Recovery from *Ps. pyocyanea* meningitis is exceptional. Botterell and Magner,[9] reporting a series of *Ps. pyocyanea* meningitis amongst wounded soldiers, found that of 11 patients only two survived. There has been one other case (C 89128) in this hospital in recent years of meningitis due to this organism which was similarly contracted after 12 days of therapy with penicillin, streptomycin, terramycin and sulfonamide; but this did not respond to polymyxin B and the patient died. In cases of this type where a second operation is planned to complete the sealing of the intracranial cavity, prophylactic antibiotic therapy

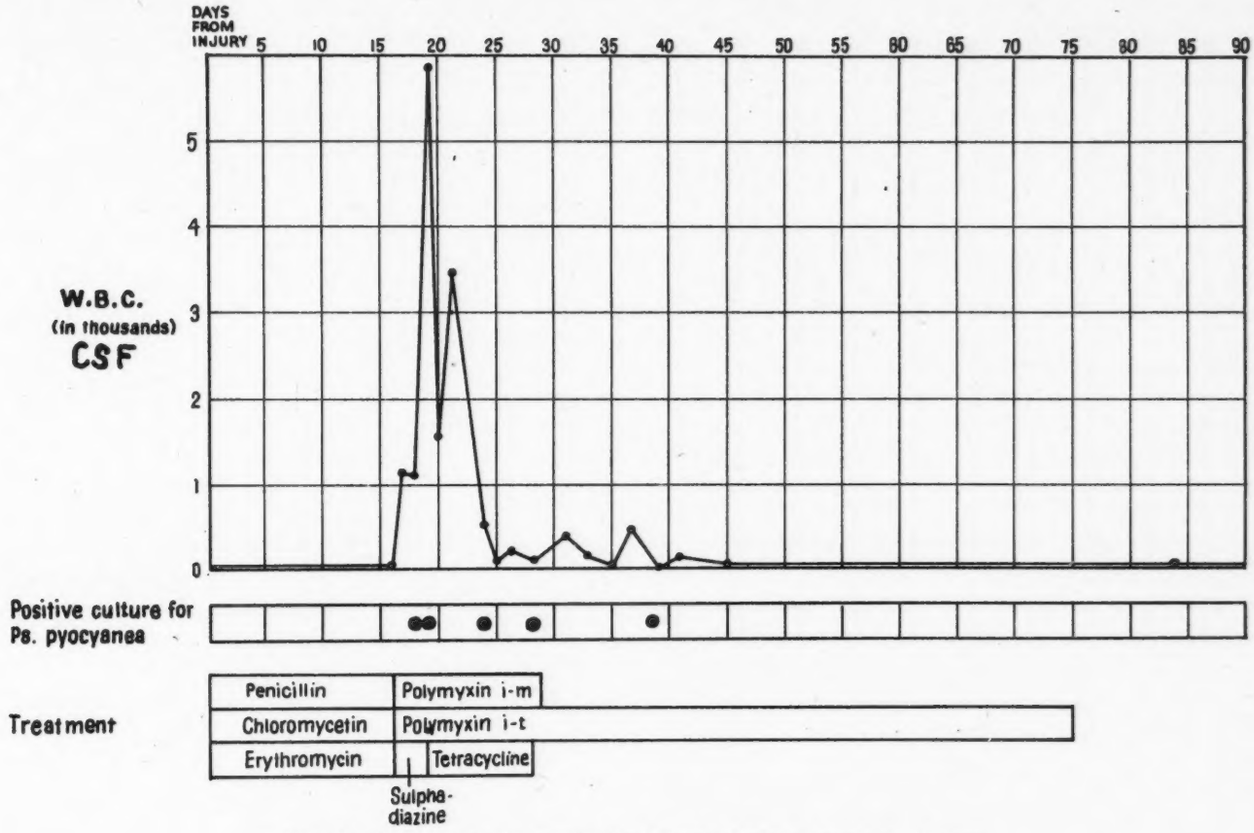

Fig. 2.—*Ps. pyocyanea* meningitis. Chart showing progress of case.

should either be omitted altogether or given only for a few days. The alternative is to complete the whole procedure in one stage, but there may be technical disadvantages in doing that if the operative field is obscured with blood and œdematous, lacerated brain. It is possible to carry out a one-stage operation under these conditions but perhaps only at the cost of removing viable brain that might otherwise have been spared.

Treatment of the Severely Comminuted Frontal Sinus

This injury is singled out for comment because of its frequency in modern industrial and automobile injuries. Improper treatment of an injured frontal sinus may later give rise to meningitis or intracranial suppuration. While every injury is different, the principles of treatment remain constant.

1. At primary débridement (the wound is usually compound) every effort should be made to preserve the supraorbital ridges. This can be done without fear for the future blood supply of the comminuted pieces, because the pericranium is here thick and firmly adherent to the bone and this attachment ensures an adequate vascularity. This contrasts with comminuted fractures of the vault itself which, in compound wounds, may have to be removed. The reason the supraorbital ridge should be preserved is that cranioplasties with use of bone substitutes (tantalum, acrylic or other plastics) show a higher tendency to break down in this region than elsewhere. The breakdown may take the form of skin erosion at the edge of the plate or erosion into the frontal sinus, and may be delayed for many years. The bed of the plate inevitably becomes secondarily infected and it has to be removed.

2. If the skin laceration is not large enough through which to explore and clean the wound, the laceration may require extending or a skin flap may have to be turned. In that case the possibility of future operations for cranioplasty or craniotomy for the repair of the anterior cranial fossa floor should be borne in mind.

3. Dural tears related to frontal sinus comminutions should be repaired when they are encountered at the initial operation. They, unlike ethmoid and sphenoid sinus fractures, are always accessible; the others may have to be dealt with at a later time (see above).

4. Frontal sinus mucosa should be preserved provided natural drainage from the sinus appears to be adequate.

5. When the frontal sinus is large and, because of extensive damage, the mucosa has to be removed, the fragments of the outer wall of the sinus should be replaced in position but the inner wall of the sinus should be removed so that a dead space is not left behind (Fig. 3).

SURGICAL TECHNIQUE

The arrival on the hospital scene of the "resistant staphylococcus" has forced the surgeon to re-learn

Fig. 3.—Removal of bone in extensive and severe comminution of the frontal sinus.

points of technique that antibiotics had encouraged him to forget. Control of infection in an operating room is directed from many points. The administrative and nursing offices no less than the bacteriological laboratory dictate operating room procedure. But in the running of a modern operating theatre it may be impossible to put into effect all the ideal measures that are aimed against the intruding pathogenic organisms. (See the report of the Medical Advisory Committee of the Ministry of Health of the United Kingdom.[10]) It is not disputed that operating rooms should be managed according to correct bacteriological principles, but operating room organization on occasion breaks down even in the best-run establishments. The surgeon, therefore, should assume that he works in a bacteriologically inimical atmosphere; he will then be all the more attentive to scrupulously good surgical technique. In this matter of the prevention of postoperative infection the surgeon is in a unique position. With good habits he will reduce infection to insignificance, but if his technique is bad, infection will follow no matter how watchful the other members of the team may be. The one important principle is that at the end of the operation the wound should consist only of healthy, viable tissue. Blood vessels should not be sacrificed unnecessarily during the surgery of access; lymphatic pathways should not be cut across. Retraction to be effective need not be savage and prolonged as may occur with the use of mechanical retractors, often toothed, that have immense powers of leverage. When the electric cautery is used the tissues will be extensively seared if they are cut or coagulated with a current stronger than that which is absolutely necessary; electric coagulation near the skin surface will declare itself later as a slough on the wound. These and allied matters sometimes seem in danger of being forgotten. Dexterity and despatch are, up to a point, virtues since they prevent unnecessarily long exposure of the wound to airborne organisms.

If the surgeon cultivates a sense of personal responsibility for his own cases of postoperative wound infection, the measures he adopts to prevent infection will be at least as effective as those that are beyond his immediate jurisdiction.

SUMMARY

Meningitis is considered from the surgical point of view as it arises in petrous fractures, fractures of the paranasal air sinuses and postoperative wound infection. Out of 693 consecutive cases of skull fracture 117 (15%) involved the petrous bone. In five of the petrous fractures meningitis developed as a consequence of the injury. Three of these cases had had CSF otorrhœa.

The value of a one-stage exploration of the middle and posterior cranial fossæ in cases of petrous fistula is reported. A case of delayed meningitis due to *Ps. pyocyanea* is recorded and the role that prophylactic antibiotic therapy played in its causation is discussed. The importance of good surgical technique in the prevention of infection is stressed.

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RÉSUMÉ

A part les abcès et les empyèmes intracraniens la plupart des cas de méningite qui passent entre les mains du chirurgien résultent de traumatismes craniens ou des suites d'une intervention antérieure. Dans une série de 693 cas de fractures du crâne traités à l'Hôpital Général de Toronto, 15% intéressaient le rocher; cinq seulement de ces 117 cas contractèrent une méningite. L'otorrhée de liquide céphalo-rachidien, sauf lorsqu'abondante, n'est pas toujours facile à reconnaître puisqu'elle peut être masquée par du sang et du sérum. Elle présente toujours un danger auquel on doit remédier en fermant l'ouverture de la dure-mère par intervention intracranienne. L'otite moyenne constitue une menace plus sérieuse si le rocher a déjà été fracturé. Les cellules mastoïdiennes et l'oreille moyenne risquent fort de s'infecter lorsqu'elles sont baignées de liquide céphalo-rachidien, même quand le tympan est intact. Les antibiotiques en supprimant la flore habituelle du nascpharynx peuvent permettre au pyocyanique de proliférer avec des résultats désastreux. Les fractures multiples du sinus frontal se retrouvent souvent dans les accidents de la route et de l'industrie; elles sont susceptibles de causer une méningite. Les auteurs donnent un bref aperçu de leur méthode de traitement de ces cas. En chirurgie cranienne comme ailleurs, l'apparition de staphylocoques résistants à tout antibiotique a posé des problèmes que seules une technique opératoire rapide et délicate et une asepsie impeccable savent résoudre.

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SCALENE NODE BIOPSY*

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THE METHOD of biopsy commonly known as scalene node biopsy has now been in use for about 10 years. Since Daniels[2] published the first report of its use in 1949, many publications have appeared from all parts of the world. The present paper describes our experience with the procedure in this particular locality.

Despite the many excellent diagnostic methods at our disposal, we are very conscious of the difficulty in arriving at an accurate diagnosis in many patients with lung disease. Histological material representing the pathological process in the lungs may sometimes be obtained by removing the lymph nodes which lie in the fat bed anterior to the scalenus anticus muscle. A diagnostic thoracotomy may therefore be made unnecessary.

The scheme of lymphatic drainage of the lungs and mediastinum described by Rouvière is generally accepted. The entire right lung drains to the right scalene nodes, and the left upper lobe drains to the left scalene nodes. The left lower lobe drains to the right scalene nodes, whereas the left midlung region may drain to either side.

The anatomy and the surgical technique involved in scalene node biopsy are well documented in various publications. The incision is made over the lateral border of the sternomastoid muscle parallel to and just above the clavicle. Overlying the scalenus anticus muscle is a space filled with fat, containing several small lymph nodes and bounded below by the subclavian vein, medially by the internal jugular vein and laterally by the omohyoid muscle. Some operators, particularly Harken,[3] have followed the veins down into the upper mediastinum and by thus extending the biopsy have been able to obtain additional lymph nodes for study.

The present series consists of 100 patients on whom scalene node biopsy was done from 1951 to 1958 inclusive. Care has been taken to exclude all cases where palpable cervical lymph nodes were present. It will be noted that this is the concept which Daniels set forth in his original publication. Various subsequent reports have been based on different criteria and have included cases with palpable lymph nodes.

TABLE I.—RESULTS OF SCALENE NODE BIOPSY

	No. of cases
1. Specific diagnosis	27
2. Non-specific findings (e.g. sinus catarrh, chronic inflammation)	28
3. Normal lymph nodes	30
4. No lymphatic tissue	15
Total	100

TABLE II.—SPECIFIC DIAGNOSIS

Diagnosis	*No. of cases*
Sarcoidosis	15
Carcinoma (secondary from lung)	8
Carcinoma (secondary from breast)	1
Reticulum cell sarcoma	1
Tuberculosis	1
Silicosis	1
Total	27

Mediastinal extension of the biopsy was not carried out in our group. Most biopsies were performed on the same side of the neck as the intrathoracic lesion. However, in a few cases of left lower lobe disease, a right scalene biopsy was carried out. Biopsy was bilateral in only one patient. The biopsies were performed by operators with varying degrees of experience, mostly members of the resident staff. Schiff and Warren[5] in their studies of autopsy material found that scalene lymph nodes show a remarkable diversity; in some cases large lymph nodes may be present, whereas in others lymphoid tissue may be scanty or even absent. However, the fact that no lymphatic tissue was found in 15 of our cases may well have been due in some instances to inexperience of the surgeon in the procedure.

TABLE III.—DIAGNOSIS OF CASES IN WHICH BIOPSY WAS DONE

Diagnosis	*No. of cases*	*Made by scalene biopsy*	*Made by histological findings from other site*	*Made by clinical, x-ray or lab. findings*
Carcinoma of lung	35	8	16	11
Sarcoidosis	22	15	1	6
Pulmonary fibrosis	7	0	0	7
Chronic pneumonitis	5	0	0	5
Pulmonary tuberculosis	4	1	0	3
Silicosis	2	1	0	1
Carcinoma of lung (secondary from breast)	2	1	0	1
Reticulum cell sarcoma	1	1	0	0
Miscellaneous conditions—lungs and abdomen	22	0	5	17
Total	100	27	22	51

The 100 patients included in the present study ranged in age from 18 to 79 years. There were 72 males and 28 females, but this sex difference has been influenced by the fact that 24 of the patients were inpatients in Camp Hill Veterans Hospital and were males. The findings fell into four main groups: (1) *specific diagnosis,* in which the examination of the scalene node made the diagnosis or in certain cases of carcinoma of the lung may only have confirmed that the disease had spread; (2) *non-specific findings,* described by the pathologist as showing various lesions such as sinus catarrh or chronic inflammation (we have been unable to attach any significance to this finding); (3) *normal lymph nodes;* (4) *absence of lymphatic tissue.*

The results are shown in Tables I and II.

Table III shows the distribution of cases, with the number diagnosed by scalene node biopsy alone, those with a histological diagnosis made by

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other means, and those in which the diagnosis was made by clinical, x-ray or laboratory investigation.

DISCUSSION

Scalene node biopsy may be carried out for two main reasons: (1) as a diagnostic measure; this is its prime importance; (2) to show whether a carcinoma of the lung has spread to the regional lymph nodes and therefore may be considered inoperable. Delarue[2] points out that in a group of cases of bronchogenic carcinoma, 12 were considered to be operable so far as evidence of extension was shown by examination of the scalene node, but at the time of thoracotomy eight were found to have mediastinal extension that made resection impossible. It would therefore seem that this biopsy procedure is valuable in carcinoma of the lung, firstly as a diagnostic procedure and secondly as an index not of operability but of inoperability.

With respect to its value as a diagnostic procedure, the present report confirms those of other investigators that it yields the best results in sarcoidosis. It is of some value in diagnosis of carcinoma of the lung, although the condition is usually strongly suspect and other diagnostic information may be obtained by bronchoscopic and cytological examination of the lung secretions. It has not proved to be of any value in our hands in the diagnosis of pulmonary fibrosis. In pulmonary tuberculosis, we have used it very infrequently and although it may occasionally have some value, this diagnosis is usually made more readily by other means. A word of caution should be given, in that occasionally the histological picture of the scalene node may not represent the disease actually present in the lung. Schwippert and Macmanus[6] report a case in which tuberculosis was diagnosed from a scalene biopsy specimen when in fact the patient was suffering from a malignant pulmonary tumour. Ten Seldam[7] has also reported sarcoid-like lesions in lymph nodes draining a carcinoma.

SUMMARY

One hundred cases in which scalene lymph node biopsy was performed between 1951 and 1958 inclusive have been reviewed. Cases with palpable cervical lymph nodes were not included in the one hundred. In 27 cases (27%), the method gave a specific diagnosis. There were 22 cases with the clinical features of pulmonary sarcoidosis, and scalene node biopsy confirmed this diagnosis in 15.

There were 35 cases of primary carcinoma of the lung, and scalene node biopsy was positive in eight of these.

Since no lymphoid tissue was found in 15% of the cases, we feel that at least in some of these the fat pad removal must have been inadequate. We agree with other observers that this procedure should not be undertaken too lightly, and that it is better to have it carried out by a few operators in any one institution, so that they may gain more experience and be successful more often.

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RÉSUMÉ

L'analyse d'une série de biopsies pré-scaléniques pratiquées de 1951 à 1958 chez cent malades a montré qu'on était arrivé à un diagnostic précis dans 27% des cas. Cette série ne comportait aucun malade présentant des ganglions cervicaux palpables. Quinze des 22 malades offrant un tableau clinique de sarcoïdose pulmonaire reçurent la confirmation du diagnostic par cette technique de biopsie, qui confirma également dans 8 cas sur 35 la présence de cancer chez des malades atteints de carcinome primaire du poumon. On ne put trouver à l'examen histologique de tissu lymphoïde dans 15% des prélèvements; il semble donc que dans un certain nombre de cas l'exploration de la graisse pré-scalénique n'a pas dû être satisfaisante. Comme l'ont déjà fait remarquer d'autres auteurs, ce procédé ne doit pas être entrepris à la légère. Il sera même préférable dans chaque institution de le laisser entre les mains de quelques opérateurs qui pourraient à la longue acquérir assez d'expérience pour augmenter l'efficacité de l'intervention.

ACUTE NON-OBSTRUCTIVE PYELONEPHRITIS

Although the pathological changes in chronic pyelonephritis constitute a frequent necropsy finding, it is not often that such cases have a history to suggest the previous presence of an infection of the urinary tract. It has been suggested that chronic pyelonephritis results from a subclinical infection that persists after an acute infection of the urinary tract, but the statistical relationships between the acute and chronic processes are in great measure unknown. It was considered useful to carry out a consecutive study in patients treated for acute pyelonephritis with the objective of determining whether or not significant grades of bacteriuria persisted after apparent recovery from the acute illness.

The study included 30 patients treated for acute pyelonephritis in a large hospital between the years 1952 and 1957. All were women between the ages of 17 and 38 years. None had any major sequelæ after the acute initial episode. Midstream specimens of urine were obtained and quantitative urinary cultures were performed. The finding of 100,000 bacteria per ml. or more was considered to indicate persistent infection of the urinary tract.

Of the subjects 27 reported no history of recurrence of symptoms after the acute initial episode. All had been treated by comparable forms of therapy, in that all had received antibiotics alone or in combination for similar periods. The quantitative urinary cultures revealed indications of a persistent or recurrent infection in eight patients, including three who had noted minor urinary symptoms. *Escherichia coli* was the original causative agent cultured in six of the eight cases and members of the paracolon group were found in the other two. In six cases the organisms persisting were the same as those cultured during the acute episode. The duration of asymptomatic infection varied from two to 18 days after the acute original illness. In two cases the persistent bacteriuria subsided spontaneously, and in the others after treatment with antibiotics.

The results of this investigation indicate that an active infection of the urinary tract can persist, without producing symptoms, after an acute uncomplicated episode of pyelonephritis.—D. S. Dock and L. B. Guze: *Ann. Int. Med.*, 50: 936, 1959.

PRIMARY ALDOSTERONISM*
A REVIEW OF MEDICAL LITERATURE FROM 1955 TO JUNE 1958

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THE SYNDROME of primary aldosteronism was first described by Conn in 1954,[1, 11] in the following terms: "In its fully developed state, it is characterized by the presence in the urine of excessive amounts of sodium-retaining corticoid, by severe hypokalemia, hypernatremia, alkalosis, and a renal tubular defect in the reabsorption of water . . . The clinical picture consists of intermittent tetany, paresthesia, periodic severe muscular weakness and 'paralyses', polyuria and polydipsia, hypertension and no edema".[1] In this paper, we wish to review all case reports of this syndrome since Conn's first description. The etiological, pathological, clinical and biochemical aspects and postoperative follow-up of 31 patients who underwent operation will be considered in order to describe the pertinent characteristics of this disease and to draw some practical conclusions. Cases where diagnosis was not established beyond doubt or the description of which was insufficient to allow comparison with others are not included.

ETIOLOGICAL ASPECTS

The total of 31 patients was composed of 12 men and 19 women (1.6 women to 1 man). The syndrome was encountered in patients from the ages of 11 years[25] to 63[21] but the peak incidence is between 30 and 45 (16 cases). Five of the cases were in children between 11 and 15 years of age.[25, 13, 27, 20, 30] Age incidence is approximately the same in both sexes. No familial incidence is reported.

TABLE I.—PATHOLOGY

I.—Adrenal glands (31 cases)

Type of lesion	*No. of cases*
Adenoma	22
Hyperplasia	3
Adenoma and hyperplasia	1
Carcinoma	2
Normal adrenals*	3

*Described as such.

II.—Kidneys (20 cases)

Type of lesion	
"Vacuolar nephropathy" (Typical of potassium depletion)	8
Arteriolar lesions	10
Nonspecific tubular lesions	3
Pyelonephritis	3
Normal kidney	4

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PATHOLOGICAL ASPECTS (Table I)

1. *Adrenal Glands*

Primary aldosteronism is always caused by selective adrenal hyperfunction. Out of 31 cases, 22 were caused by adenoma, 3 by hyperplasia, 1 by adenoma and hyperplasia in the same gland, and 2 by carcinoma. In three patients, the adrenals were described as normal.

Typically, the adenoma is a small, spherical, and encapsulated tumour, with an average diameter of 1 to 4 cm. (the largest one reported had a diameter of 6 cm.).[27] It is located in the cortex of the gland, more or less bulging over the surface, and the cut section is brilliant yellow. Except for two cases of multiple adenomas of the same gland,[22, 25] the tumour was solitary.

The first[2] of the two carcinomas was a roundish tumour of 4-cm. diameter practically destroying the whole right adrenal. The left gland was normal. On cut sections, the gland was composed of a canary-yellow carcinoma, a normal medulla and a small amount of residual cortical tissue. Three months after surgical removal of this tumour, the patient died, after complaining again of the same symptoms. At autopsy, a huge retroperitoneal mass was found with metastases to liver, bone marrow and lungs. The left adrenal was half its normal size. The second malignant tumour reported[17] was a large mass weighing 1400 g., located at the upper pole of the left kidney and extending towards the midline and around the great vessels. The cut surface was extremely irregular though nodular and was made up of soft yellow tissue with darker brown areas. Post-mortem examination was not performed in this case.

To assess the clinical significance of histological lesions of diseased adrenals and the delimitation of the different zones is extremely difficult, even for a competent pathologist. It is worth while here to quote Ayres and co-workers on the histology of aldosterone-secreting adrenal adenomas: "We have discussed the findings in four cases of Conn's syndrome with several morbid anatomists, and the conclusion we have reached is that they cannot be distinguished microscopically or histologically from the glucocorticoid secreting tumours of Cushing's syndrome. Although some areas of large, pale, lipid-laden cells appeared to be arranged in a glomerulosa pattern, each cell is quite different from normal glomerulosa cells, and other areas of small deeper staining cells may be arranged in a fasciculata pattern. Thus, it appears that adrenal histology does not enable one to predict the function of these tumours".[39] For this reason, we will describe only briefly the microscopic appearance of the adrenal lesions.

(a) Hyperplasia (3 cases). In one case, there was no predominant zone.[34] In another,[30] the zona glomerulosa was prominent and increased in width. In the last case,[13] the fasciculata appeared wider than usual.

(b) Adenoma (22 cases). In five cases, the tumour looked like the zona fasciculata; in one case, like the zona glomerulosa; in three others, like the zona fasciculata in certain areas and like zona glomerulosa in other parts of the same tumour. In eight patients, no microscopic study of the adrenal was reported. In those cases of adenomas, one may find atrophy of a cortical zone in the homolateral or contralateral gland. In three cases, atrophy of zona fasciculata is reported; in eight others, there is no zonal atrophy.

(c) Carcinoma (2 cases). The first carcinoma[2] and its metastases were composed of three different types of cells but the report did not state whether or not these cells resembled normal cortical cells. The second one[17] is described as a well-differentiated carcinoma of the adrenal cortex with some giant cells and areas of necrosis without further details.

As we shall see in the clinical part, arterial hypertension is the cardinal sign of primary aldosteronism. A certain degree of correlation may be established between the age of the patient, the severity of the hypertension and the pathological picture of the adrenal gland. (1) Out of six cases reported in patients between 10 and 20 years of age,[25, 14, 30, 13, 29, 27] four out of the five (one author[29] does not specify the severity of his patient's hypertension) suffered from a malignant type of arterial hypertension. These are the only cases of malignant hypertension in this group of 31 patients. (2) Three cases of adrenal hyperplasia were reported. Two of them were in young patients[14, 30] with malignant hypertension; the third one was in a 46-year-old man with severe arterial hypertension.[34] (3) The three patients who had "normal adrenals" were young subjects below 20 years of age. The first of them had malignant hypertension;[13] the severity of the hypertension in the second was not specified;[29] the third one had benign hypertension.[27] (4) Adenomas were found in all age groups and with various degrees of arterial hypertension, but no malignant form of hypertension except in one case[25] where the patient was 11 years old and had multiple adrenal adenomas. This represents the only case of adenoma reported in a patient between 10 and 20 years of age. (5) The two patients suffering from adrenal carcinoma were respectively 60 and 35 years of age,[2, 17] and did not present a malignant type of hypertension.

Briefly, adrenal hyperplasia is usually found in young patients and associated with a malignant or severe type of hypertension. Primary aldosteronism with "normal adrenals" is reported only in patients below 20 years of age. Carcinoma is uncommon. Adenoma, the lesion most frequently seen, belongs to all age groups and is associated with arterial hypertension of varying severity.

2. *Kidneys*

There are no specific renal lesions in primary aldosteronism. Two main types of lesions are seen: first, "vacuolar nephropathy" (8 cases) which is characterized histologically by the typical vacuolar aspect of proximal tubular cells found in patients with hypokalæmia of long duration, and second, the arteriolar lesions (10 cases) which one finds usually with any severe arterial hypertension of long duration. Out of the 31 cases reported, only 20 included a histological description of kidney lesions.

3. *Muscles*

Before onset of therapy, the patient of Foye and Feichtmeir[2] had a muscle biopsy taken which showed degenerative lesions with partial loss of cross-striation and non-specific cellular infiltration. After administration of potassium, a second biopsy of the same muscle revealed a normal histological pattern.

CLINICAL ASPECTS

Primary aldosteronism is characterized clinically by the following three groupings of signs and symptoms:

1. Signs and symptoms of arterial hypertension: arterial hypertension, headaches, amblyopia.

2. 'Renal' signs and symptoms: polyuria, nycturia and polydipsia.

3. Neuromuscular signs and symptoms: (a) acute episodes of muscular weakness or paralysis, (b) spontaneous or latent tetany, (c) paræsthesiæ, (d) muscle cramps and pains.

TABLE II.—MODE OF ONSET (29 CASES)

	No. of cases
Acute episode of muscular weakness	7
Acute episode of muscular paralysis	2
Arterial hypertension	12
Headache	12
Polyuria, polydipsia and/or nycturia	10
Convulsion and loss of consciousness	1

Mode of Onset

These patients seek medical advice for any of four main reasons: (1) high blood pressure, (2) headaches, (3) polyuria and/or nycturia and/or polydipsia, (4) acute episodes of muscular weakness or paralysis.

High blood pressure with or without headache was the sole presenting feature of many patients.[9, 22, 20, 21, 8, 3, 19, 24, 34, 31, 17] The patient reported by Holten and Petersen[13] had, at the beginning, arterial hypertension with episodes of faintness and convulsions. Polyuria and polydipsia were the first symptoms for the patient of Foye and Feichtmeir;[2] these symptoms were followed, only eight months later, by episodes of muscular weakness and pains. The 17-year-old patient of van Buchem[12] had suffered from polyuria, enuresis and polydipsia since childhood; these were accompanied by arterial hypertension which was discovered when he was first seen. Bartter and Biglieri[27] de-

scribe the same type of onset in their 13-year-old patient. Paroxysmal muscular weakness with tetany was the earliest symptom in the case reported by Hellem.[4] Russell's patient[15, 16] had a short episode of muscular weakness of one week's duration involving both upper limbs; subsequently she was completely asymptomatic for a period of a little less than a year. Then the same symptom reappeared accompanied by polyuria and nycturia. A flaccid quadriplegia of two weeks' duration marked the onset of the disease in the patient of Milne and Evans.[35, 9]

TABLE III.—MAJOR SYMPTOMS (31 CASES)

	No. of cases
Polyuria and polydipsia and/or nycturia	26
Acute episodes of muscular weakness	22
Acute episodes of muscular paralysis	11
Headache	19
Paræsthesia	8
Muscular cramps and pains	7
Attacks of tetany	7
Amblyopia	4

TABLE IV.—MAJOR SIGNS (31 CASES)

	No. of cases
Arterial hypertension	31
Lesions of hypertensive retinopathy (exudates and/or hæmorrhages and/or papillœdema)	11
Muscular weakness	13
Spontaneous tetany	2
Chvostek's sign	4
Trousseau's sign	6
Tendon hyperreflexia	7
Tendon hyporeflexia	4
Muscular paralysis	2

CLINICAL PICTURE (Tables III and IV)

Headache, arterial hypertension, nycturia, polyuria, polydipsia and periodic muscular weakness are the symptoms and signs most frequently seen.

I. ARTERIAL HYPERTENSION AND HEADACHES

Headaches are of no special type. Arterial hypertension is a constant finding in all cases reported and it is the cardinal sign in this syndrome. It is both systolic and diastolic and of varying severity. There is no clinical means of differentiating it from the so-called essential type. Hypertensive retinopathy (hæmorrhages and/or exudates and/or papillœdema) was described in 11 patients. Four of them,[25, 14, 13, 30] all below the age of 20, had bilateral papillœdema and they were the only cases of malignant hypertension reported in this group of 31 patients.

II. POLYURIA, POLYDIPSIA AND NYCTURIA

Twenty-six patients suffered from one or more of these renal symptoms. Brooks and associates emphasize the fact that in their two patients the polyuria was solely nocturnal.[17] In four cases, these renal symptoms were accompanied by a marked "dry-mouth feeling".[6, 21, 26] Polyuria and polydipsia were intermittent in Skanse's patient.[20] Chalmers and co-workers[10] report that, in their patient, the polyuria and nycturia increased considerably during the episodes of muscular paralysis.

III. NEUROMUSCULAR SYMPTOMS AND SIGNS

(a) *Muscular Weakness and Paralyses*

Muscular weakness may be very slight[10] or quite severe and take the aspect of a true flaccid paralysis.[35, 9, 15, 16, 20, 7, 21, 10, 8, 31, 11, 36, 30] Of sudden onset, these episodes of muscular weakness or paralysis may happen any time during the day with no obvious trigger mechanism, except in two cases[35, 9, 1, 11] where exposure to cold seemed to induce the crises. These episodes may last from a few hours[20] to several days or weeks.[35, 9] Sites of paresis or paralysis are often scattered. Involvement may begin in one limb or in the muscles of the face[20] and then disappear after a while or, instead, spread to other parts of the body. It may also begin with a sudden quadriplegia or with dyspnœa[20] or dysphagia.[21] Some patients had paralysis of the muscles of the neck and were barely able to lift their head from the pillow.[10, 7, 21] Paræsthesiæ and muscular pains may accompany this muscular weakness.[15, 16] The frequency of these episodes is extremely variable. Russell[15, 16] reports a case where there was a one-year interval between the first and the second episode; on the other hand, another patient had approximately two attacks per week.[30] A few patients never experienced muscular weakness or paralysis during the course of their illness.[9, 13, 14, 27, 17] Others suffered from episodes of muscular weakness but without paralysis.[21, 24, 22, 6, 10, 3, 4, 25, 29, 34] Between these episodes of paresis or paralysis, patients are usually asymptomatic or some may complain of a persistent asthenia.[8, 31, 25] At the time of admission to hospital, 13 patients had muscular weakness; only two had overt paralysis.[35, 9, 8] No pyramidal or extrapyramidal signs accompany this paralysis or paresis.

(b) *Tetany*

Seven out of 31 patients suffered from tetany during the course of their illness.[1, 11, 7, 29, 3, 4, 30, 31] These attacks usually occur between episodes of paresis or paralysis. The tetanic spasms occur in the hands or both upper or lower limbs or start with a generalized tetanic state.[31] They may last from a few minutes to 24 hours and usually disappear without any treatment. In Genest's patient, a period of polypnœa was observed just before two such tetanic attacks.[30] On admission, only two patients had overt tetany.[7, 3] In six others, latent tetany was revealed either by the presence of Trousseau's sign[1, 11, 22, 20, 3, 24, 31] or Chvostek's sign[1, 11, 22, 21, 3] or by the forced hyperventilation test.[7]

(c) *Tendon Reflexes*

In most cases, normal tendinous reflexes are present. However, paralysis or severe muscular

weakness is usually accompanied by hyporeflexia or areflexia,[35, 9, 8, 2, 15, 16] and overt or latent tetany, by hyperreflexia.[1, 11, 22, 20, 7, 21]

(d) *Paræsthesia and Muscular Pains*

Paræsthesiæ are most often localized to the distal part of the extremities and may or may not be associated[20] with episodes of muscular weakness. They are intermittent and of short duration.[20, 7, 13, 8, 3, 4, 30, 31] Seven patients had muscular pains.[15, 16, 21, 2, 8, 3, 26, 31] Usually, these pains are experienced as muscle cramps or ill-defined myalgias.

IV. OTHER CLINICAL ASPECTS

1. *Fainting Spells*

Two patients fainted during the course of their illness.[13, 21] The 13-year-old patient of Holten and Petersen lost consciousness with generalized convulsions frequently, during which the electroencephalogram was abnormal. These episodes were not followed by muscular weakness. In the other case reported by Hewlett,[21] a loss of consciousness of 15 minutes' duration followed by mental confusion and neck-muscle paralysis occurred eight months before the patient's admission to hospital.

2. *Œdema*

Œdema is usually absent in primary aldosteronism. However, a few cases with œdema have been reported either associated with overt cardiac insufficiency[19, 22] or without obvious cause.[26, 17, 25] In these last three cases, there was a slight swelling of the retromalleolar[26, 17] or palpebral regions.[25] At this point, we must report the interesting case of Goldsmith *et al.*[28] This patient had symptoms of primary aldosteronism, of secondary aldosteronism (œdema) and of salt-losing nephritis. After surgical removal of an adrenal adenoma, the œdema and the signs of primary aldosteronism disappeared but the manifestations of salt-losing nephritis remained unchanged.

3. *Retardation of Growth and Development*

Van Buchem's 17-year-old patient showed, in addition to the usual clinical picture, a marked retardation of growth (bone age: 13 years) associated with the absence of beard, mustache, and axillary and pubic hair. Van Buchem attributes this stunting not to an endocrinological disturbance since the urinary levels of 17-hydroxycorticosteroids and 17-ketosteroids were normal, but to the deleterious effect of prolonged hypokalæmia on the cellular metabolism of a growing boy.[12]

4. *Cushingoid Features*

There were no cushingoid features reported in primary aldosteronism, except for a moderate degree of obesity with slight hirsutism noted in one case[24] and easy bruising noted in another.[21]

TABLE V.—BLOOD VALUES

	Normal	*Increased*	*Decreased*
Sodium	8	19	2
Potassium	0	0	31
Chloride	0	0	22
Calcium (total)	21	0	0
CO_2 combining power	5	24	0
pH	3	9	0
Blood sugar	15	3	0
Eosinophils	13	0	1

5. A few patients presented with vomiting and ill-defined muscular pains,[13] some with episodes of diarrhœa[10, 8] and others with a marked craving for salt and salty foods.[30]

LABORATORY FINDINGS

1. *Blood Values* (Table V)

(a) Hypokalæmia is a constant finding in all cases. The lowest potassium level was 1.4 mEq./l.[35, 9]

(b) Alkalosis is present in the majority of patients. It may be very marked (Conn's patient[1, 11] had a blood pH of 7.62 with a CO_2 combining power of 82 volumes % or 36.9 mEq./l.) or slight (in Hewlett's second case the CO_2 combining power varied between 28.2 and 31.2 mEq./l.; in his third case between 27.1 and 31 mEq./l.[21]) or absent (Genest's patient[30] had a venous pH of 7.35 and an arterial pH of 7.43 with a CO_2 combining power of 26 mEq./l.).

(c) Plasma sodium was increased in 18 patients out of 31, but may be normal or even decreased.[13, 34]

(d) Chlorides are usually at the lower limit of normal or decreased.

(e) Total and ionized calcium are normal in the cases where they were determined.

(f) Blood sugar is usually normal. However, Hewlett's first and third cases had a typical diabetic response to glucose administration, and his second case had a fasting blood sugar level well above the normal range.[21]

(g) Plasma magnesium measured in five cases was normal in two;[21] at the lower limit of normal in one,[34] and decreased in two.[3, 24]

(h) There was no eosinopenia except in one patient[2] where values of 72 and of 36 eosinophils per c.mm. were found.

2. *Electrocardiographic and Radiological Findings*

(a) Of 27 patients the electrocardiogram showed patterns suggesting hypokalæmia in 20. Two patients had signs of left ventricular hypertrophy with prominent "U" waves. In five other patients the E.C.G. either was normal[30] or showed signs of left ventricular strain or hypertrophy.

(b) An adrenal tumour was found in two cases[17, 27] out of 24 by plain films of the abdomen or intravenous pyelogram. The use of retroperitoneal air insufflation revealed an abnormal shadow suggestive of a tumour in 10 cases out of 22.

TABLE VI.—URINE

	Results	*No. of cases*
Specific gravity	Less than 1010	9
	From 1010 to 1015	8
	1015 and over	1
Water deprivation test	Normal response	5
	No change in specific gravity	15
Pitressin test	Normal response	2
	No change in specific gravity	10
Albuminuria	None	5
	Present	21
Urinary infection	None	15
	Present	4
Urinary pH	Alkaline	17
	Acid	1
	Neutral	2

3. *Renal Function* (Tables VI and VII)

The most important and most distinctive alterations of kidney function in primary aldosteronism are:

(a) Marked polyuria (mainly nocturnal in some cases[17]).

(b) Large urinary loss of potassium. This excessive waste of potassium is apparent in all the cases where potassium intake and output were measured. The ratio of potassium clearance to inulin clearance was 1.16 in the patient of Chalmers and Fitzgerald in spite of the fact that the plasma potassium level was only 1.9 mEq./l.[10] Eales and Linder[7] point out that a normal subject under ordinary circumstances excretes less than 15% and rarely more than 20% of the "glomerular-filtered" potassium; their patient excreted 35% of the filtered potassium at the beginning of her disease and 75% one year later.

(c) Alkaline urinary pH.

(d) Urine of low specific gravity. Half of the cases reported have a urinary specific gravity of less than 1010. No change in urinary specific gravity was noted after fluid deprivation or pitressin administration.

(e) Slight or moderate albuminuria in 21 cases out of 26. It is interesting to underline that urinary infection was noted in only 4 cases out of 19.

In patients with primary aldosteronism, renal function can be modified by three main factors: prolonged hypokalæmia resulting in the production of vacuolar nephropathy; pyelonephritis, the occurrence of which is enhanced by prolonged potassium depletion; and arterial hypertension of long duration giving rise to arteriolar lesions in the kidneys.

It is difficult therefore to attribute a change in renal function to any given factor, especially when different tests of measurement of renal function (clearances of urea, creatinine, inulin, mannitol and para-aminohippuric acid, phenolsulfonphthalein excretion) were used. Out of 27 patients, 16 had normal or slightly decreased renal function.

TABLE VII.—RENAL FUNCTION (27 CASES)

Author	*Year*	*Renal function*	*Renal lesions*
Conn	1955	Creat. clear.: 87 to 119 c.c./min. P.S.P. 50% in 15 min.	Marked arteriolosclerosis Vacuolar nephropathy
Milne	1956	Renal function: slightly impaired	None—normal kidney
Nassim	1957	Decreased G.F.R.	———
Milne	1954	Creat. clear.: 65 c.c./min.	Severe bilateral pyelonephritis
Russell	1956–7	Inulin clear.: 42 c.c./min. Diodone clear.: 200 c.c./min.	———
Skanse	1957	Creat. clear.: 98 c.c./min.	Vacuolar nephropathy
Crane	1956	Creat. clear.: Normal P.S.P.: 55% in 2 hours	———
Eales	1956	Creat. clear.: 125 c.c./min. Inulin clear.: 134 c.c./min. P.A.H. clear.: 793 c.c./min.	Slight vacuolar nephropathy Focal ischæmic atrophy and attempts at renal tubular regeneration—some arterioles showed hyalinization
Hewlett	1957	1. Mannitol clear.: 109 c.c./min. P.A.H. clear.: 412 c.c./min. 2. Mannitol clear.: 113 c.c./min. P.A.H. clear.: 262 c.c./min. 3. Mannitol clear.: 84 c.c./min. P.A.H. clear.: 443 c.c./min.	——— Atrophy and fibrosis of the tubules ———
Foye	1956	Creat. clear.: 81 c.c./min.	———
Van Buchem	1956	Creat. clear.: 96 c.c./min. P.S.P.: 80% in 2 hours	Thickening of the arterioles; dilatation of the tubules
Holten	1956	Creat. clear.: 60 to 90 c.c./min.	None—normal kidney
Chalmers	1956	Inulin clear.: 44.5 c.c./min. P.A.H. clear.: 220 c.c./min.	Vacuolar nephropathy Hypertensive nephrosclerosis with great thickening of the arteries
Mader	1956	Inulin clear.: 55.5 c.c./min. P.A.H. clear.: 445 c.c./min.	———
Fine	1957	Creat. clear.: moderately decreased	Vacuolar nephropathy Focal embolic glomerulonephritis
Hellem	1956	Creat. clear.: 34 c.c./min.	———
Hudson	1957	Creat. clear.: 110% of normal	———
Crane	1958	P.S.P.: 70% in 2 hours	Some arteriolar sclerosis
Bartter	1958	1. P.S.P.: 60% in 1 hour	Arteriolar sclerosis and focal thrombonecrosis
		2. Inulin clear.: 108 c.c./min.	Normal kidney
Genest	1958	Inulin clear.: 140 c.c./min. P.A.H. clear.: 560 to 680 c.c./min.	Vacuolar nephropathy
Siguier	1958	Mannitol clear.: 160 c.c./min. P.A.H. clear.: 380 c.c./min.	Vacuolar nephropathy
Brooks	1957	1. Creat. clear.: 78 c.c./min.	Focal ischæmic changes due to arteriosclerosis. Patchy deposition of calcium salts involving the walls of collecting tubules.
		2. Inulin clear.: 64 c.c./min. P.A.H. clear.: 267 c.c./min.	Histology consistent with malignant hypertension

TABLE VIII.—URINARY ALDOSTERONE, 17-HYDROXYCORTICOSTEROID AND 17-KETOSTEROID EXCRETION (27 CASES)

Author	*Year*	*Aldosterone*	*17-hydroxy*	*17-keto*	*Comment*
Conn	1955	Incr.	N.	N.	Adenoma
Milne	1956	N.	—	—	Adenoma
Nassim	1957	Incr.	—	—	Adenoma
Milne	1954	Incr.	—	—	Adenoma
Russell	1956-7	N.	—	N.	Adenoma
Mucio	1957	Incr.	N.	N.	Adenoma
Skanse	1957	Incr.	—	N.	Adenoma
Crane	1956	—	N.	N.	Adenoma
Eales	1956	Incr. & N.	N.	N.	Adenoma
Hewlett	1957	1. Incr.	—	N.	Adenoma
		2. Incr.	—	N.	Adenoma
		3. Incr.	—	—	Adenoma
Foye	1956	Incr.	—	N.	Carcinoma 17-keto-corticosteroid markedly increased
Van Buchem	1956	Incr.	N.	N.	Hyperplasia
Holten	1956	Incr.	—	N.	"Normal adrenals"
Chalmers	1956	Incr. & N.	—	—	Adenoma
Mader	1956	Incr.	Slight incr.	N.	Adenoma
Fine	1957	Incr.	N.	N.	Adenoma
Hellem	1956	—	—	N.	Adenoma
Hudson	1957	— ?	Upper limit of N	Upper limit of N.	Adenoma (moderate obesity, slight hirsutism)
Crane	1958	N. & incr.	N.	N.	Adenoma
Bartter	1958	1. Incr. & N.	N.	—	Hyperplasia
		2. Incr.	N.	—	Adenoma
Genest	1958	Incr.	N.	N.	Hyperplasia
Siguier	1958	Incr.	N.	N.	Adenoma
Brooks	1957	1. Incr.	—	Incr.	Carcinoma (17-keto-corticosteroid incr.)
		2. N.	—	N.	Adenoma

LEGEND: Because of the multiplicity of methods used, comparison of values obtained is useless. Therefore only the significance of the results is given.
Incr.: increased.
N. : normal.
— : not done.
— ? : done but the author does not mention the method used or the normal value.

In five cases,[4, 9, 10, 15-17, 35] where renal function seemed to be markedly altered, histology of the kidney showed either a marked arteriolar sclerosis and/or severe pyelonephritis and/or vacuolar nephropathy.

4. *Hormonal Studies*

(a) Urinary aldosterone.

The urinary aldosterone output in 21 patients out of 24 was high. In three cases however, urinary aldosterone values were normal.[9, 15-17, 35] It is quite possible that high values might have been obtained in those on repeated determinations, for in other cases[7, 10, 26, 27] normal and high values were found.

(b) Urinary 17-hydroxycorticosteroids and 17-ketosteroids

Urinary 17-hydroxycorticosteroid and 17-ketosteroid excretions were normal in all patients with non-malignant lesions, except in two where there was a minimal increase.[3, 24] On the other hand, 17-keto-corticosteroids were well above normal in both cases of carcinoma and a normal 17-ketosteroid excretion was found in the first case[2] and increased 17-ketosteroid excretion in the second one.[17]

(c) Other urinary corticosteroids

In addition to these hormonal determinations, Genest *et al.*[30] have carried out extensive steroid studies. Repeated determinations for cortisone, hydrocortisone and their tetrahydro derivatives, for the tetrahydro derivatives of 17-hydroxy, 11-desoxy-corticosterone, etiocholanolone and pregnantriol were all within normal limits.

(d) Effect of ACTH

Conn[1, 11] in his papers points out the paradoxical effect of ACTH on urinary excretion of sodium and potassium. In his patient, 80 units of ACTH were given intramuscularly daily for five consecutive days. The sodium balance, which was slightly positive during the first two days, became negative on the third day with a marked sodium loss in the urine. Potassium balance followed the same pattern but to a lesser degree. The same observation has been reported by other authors.[4, 20, 26, 31] On the other hand, Eales and Linder[7] obtained sodium retention with diuresis of potassium on administration of ACTH. Using intravenous cortisone, Mader and Iseri[3] observed in their patient a marked urinary loss of sodium, chloride and water accompanied by a less important loss of potassium. The same results have been obtained with Δ^1-9α-fluorocortisone.[31] As pointed out by Siguier *et al.*[31] and Brooks *et al.*[17] there is here a striking parallel between sodium and potassium balance. The effect of ACTH is to produce a normal increase in 17-hydroxycorticosteroids and 17-ketosteroids in primary aldosteronism;[30] only Bartter and Biglieri reported a response below normal.[27]

In Genest's patient, aldosteronuria increased four-fold under ACTH;[30] Siguier *et al.*[31] and

TABLE IX.—CORTICOSTEROID CONTENT OF SOME REMOVED TUMOURS OR GLANDS
(In μg./g. of tissue)

	Normal Neher,[40] Hudson, Lombardo	*Adenoma Mader and Iseri,[3] Neher[40]*	*Adenoma Neher[40]*	*Adenoma Neher[40]*	*Adenoma Conn and Louis[11]*	*Hyperplasia Genest et al.[30]*	*Adenoma Eales and Linder[7]*
Cortisol	2.3 –5.5	9.0	3.5	4.0	—	30.7	0.2
Cortisone	0.04–0.39	0	less than 1.0	0	—	29.7	—
Aldosterone	0.05	1.4	1.05	1.08	8.7	3.64	5.6

Kennedy *et al.*[29] also report an increase but to a lesser degree. However, Eales and Linder's results are far less conclusive on this matter.[7]

(e) Corticosteroid content of removed tumours and glands

A few authors[1, 3, 7, 11, 14, 17, 19, 20, 30, 40] have analyzed the corticosteroid content of removed glands or tumours. Table IX sums up the results obtained in a few of these cases.[1, 3, 7, 11, 30, 40] In Genest's patient, in addition, adrenal gland incubation was carried out,[30] and the release of aldosterone by adrenal slices during eight hours' incubation was 11.6 μg./g. of tissue, as compared to 5.8 which was the highest aldosterone value obtained in a case of Cushing's.[30]

5. *Special Tests*

Sodium and potassium determinations in striated muscle[1, 10, 11, 14, 22] show an increase of intracellular sodium with a decrease of intracellular potassium. These findings are corroborated by other studies[3, 10, 26] which emphasize the increase of intracellular as well as of extracellular sodium and the decrease of the total exchangeable potassium (determined by the method of isotopic sodium and potassium dilution techniques). There is a decrease in sodium and chlorides and an increase in potassium in sweat and saliva of most patients.[1, 10, 11, 19, 20] However, this is not a constant finding since Hudson *et al.*[24] and Brooks *et al.*[17] have found values in the normal range. Romanelli *et al.* reported a normal pulmonary artery pressure in their hypertensive patient.[23] Van Buchem's patient[12, 14] had no free hydrochloric acid in his gastric juice, but, after surgical cure, the amount of acid rose to high levels.

VARIOUS MODIFYING INFLUENCES

1. *Modifications due to Dietary Changes*

By changing the dietary amounts of sodium and potassium, one may intensify or lessen the symptoms and signs in primary aldosteronism. However, taking into consideration our present knowledge of the physiological effects of aldosterone, it is difficult to interpret the results obtained.

(a) High potassium (up to 200 mEq./day) diet with normal sodium intake

With this diet, a few patients[2, 7, 15-17, 27, 29] have been markedly improved clinically and biochemically. On the other hand, in most cases the signs and symptoms showed a certain degree of resistance to potassium administration. The clinical and biochemical picture remained unchanged in the patients of Skanse,[20] Hellem[4] and Conn[1, 11] in spite of brief initial retention of potassium with an increased natriuresis. In other cases[3, 9, 26, 35] a marked clinical improvement was obtained but plasma potassium remained at or below the lower limit of normal. Potassium loads increased aldosteronuria in a few patients.[7, 27]

(b) Low sodium diet with normal potassium intake

With this regimen, Bartter and Biglieri[27] obtained a gradual reduction of urinary sodium to zero without any increase in urinary aldosterone. In addition, blood pH and plasma potassium remained in the normal range.

(c) Low sodium (25 mEq./day) diet with high potassium (270 mEq./day) intake

With such a diet, Brooks and co-workers[17] obtained a slightly negative sodium balance with a strongly positive potassium balance.

(d) High sodium diet with normal potassium intake

A markedly positive sodium balance accompanied by a strongly negative potassium balance was noted in Brooks and McSwiney's patient.[17] In spite of the high sodium intake, urinary aldosterone levels remained high in both patients of Bartter and Biglieri.[27] On the other hand, a marked natriuresis followed by a decrease in aldosteronuria and a negative potassium balance were obtained in Siguier's patient.[31]

2. *Modifications due to Administration of Specific Drugs*

(a) Acetazolamide. The administration of acetazolamide raised the urinary pH in the patients of Milne and Evans[9, 35] and of Russell.[15, 16] It produced in Eales and Linder's patient[7] a large increase in the amount of urinary potassium with an associated lowering of plasma potassium (from 3.22 mEq./l. to 2.66 mEq./l.) and was accompanied clinically by paræsthesiæ.

(b) Chlorothiazide. Used intravenously by Genest *et al.*,[30] at a dosage of 10 mg. per kg. of body weight, chlorothiazide induced a marked sodium, potassium and chloride diuresis in spite of the high aldosteronuria level in their patient. In addition, there was a 65% decrease in the glomerular filtration rate with a lowering of the filtration fraction from 25% to 15%.

(c) Spirolactone (Searle SC-8109). Given at a dosage of 1.2 g. per day during two days,[30] this aldosterone antagonist significantly increased the urinary excretion of sodium on the second day of its administration. In addition there was a slight decrease in urinary conjugated 17-hydroxycorticosteroids without any change in urinary levels of free cortisone, hydrocortisone and aldosterone.

(d) Intramuscular reserpine. On two occasions 2.5 mg. of reserpine was administered intramuscularly to Genest's patient.[30] The first administration, after a 24-hour latent period, resulted in a marked drop in blood pressure lasting two days and was accompanied by orthostatic hypotension. It was associated with a marked retention of sodium and chlorides and to a lesser degree, of potassium, without any change in aldosteronuria. A slight increase in the urinary cortisone and hydrocortisone levels was noted. The results from the second administration obtained after a 36-hour latent period were similar, except for orthostatic hypotension which lasted almost four hours and a more severe degree of sodium, chloride and potassium retention. No change was noted in urinary aldosterone, cortisone and hydrocortisone excretion values.

(e) Human growth hormone (S.T.H.). Five mg. of human S.T.H. was given twice at 12-hour intervals to Genest's patient.[30] No modification occurred in the urinary excretion pattern of sodium, potassium, chloride, aldosterone, cortisone, hydrocortisone, or free and conjugated forms of the 17-hydroxycorticosteroids.

(f) Posterior pituitary extract. Siguier[31] observed an increase in urinary aldosterone level after administration of this extract.

SURGICAL CURE AND POSTOPERATIVE FOLLOW-UP

1. Type of operation performed:

In most patients having a single adrenal adenoma, unilateral adrenalectomy or a simple adenomectomy when technically feasible provides an efficient and elegant means of complete cure. Surgical cure is achieved in bilateral hyperplasia either by bilateral subtotal adrenalectomy[12] or by bilateral total adrenalectomy.[30] When the adrenals appear grossly normal, bilateral subtotal adrenalectomy is advisable, although Holten and Petersen[13] and Kennedy *et al.*[29] did obtain good results in their two patients with unilateral adrenalectomy. In all instances, the best surgical approach is the anterior transabdominal route by which both adrenals can be seen simultaneously.

Before, during and in the first few days following surgery, most authors gave their patients large amounts of potassium orally or intravenously, and cortisone or one of its analogues, and/or ACTH.

2. Postoperative follow-up:

The postoperative course is conditioned by three main factors: the biochemical and clinical severity of the disease before surgery; the kind of treatment received by the patient before, during and after surgery; and finally, the type of surgical operation performed.

(a) *Postoperative follow-up of patients who underwent unilateral adrenalectomy*

Most patients belonged to this group. During the 12 to 20 days after surgery, they showed a marked potassium retention associated with a large natriuresis, which re-established the normal electrolyte equilibrium; while the alkalosis disappeared and the CO_2 combining power decreased to a normal level. The three patients of Hewlett *et al.*[21] showed a progressive drop of CO_2 combining power to values of 17.6, 23.1 and 19.6 mEq./l. in two to six months after surgery; in the last case, this was accompanied by hyperkalæmia. Relman's patient suffered from chronic hypoaldosteronism for many months after unilateral adrenalectomy.[18] Notwithstanding these exceptions, a rapid and progressive return of electrolyte balance and blood pH to normal was the rule.

In one of Hewlett's patients, the diabetic state was improved by unilateral adrenalectomy, and in another, the glucose tolerance, which was typically diabetic before surgery, improved after operation.[21] After a surgical cure, the urinary aldosterone level became normal[7, 13, 20, 22] or so low that it was impossible to measure.[1, 11, 21, 24, 29, 31] The 17-hydroxycorticosteroid and 17-ketosteroid urinary excretion usually was not modified. Electrocardiographic changes disappeared and electrolyte disturbances in sweat and saliva were completely corrected. Renal function tended to improve after surgery. It must be emphasized, however, that irreversible kidney damage will not be modified by operation.

1. Polyuria, polydipsia and nycturia usually disappear rapidly in five to 15 days.

2. The marked urinary potassium loss also ends quickly, as proved by Eales and Linder[7] and Chalmers *et al.*[10]

3. Urinary pH is back to normal in one or two weeks.

4. Albuminuria disappears in most cases in one to four weeks.

5. The concentrating power of the kidneys is restored to normal in one to seven months after the operation.

6. In patients in whom a more detailed study of renal function is performed after surgery,[7, 10, 13, 15, 16, 21, 22] a significant decrease in glomerular filtration rate and renal plasma flow, often associated with an increase of blood urea, can be reported during the first postoperative months. Very gradually, in two to twelve months, these abnormalities subside and renal function returns to normal.

In general, clinical symptoms and signs disappear after the operation. Blood pressure drops to normal levels most often during the first few days[6, 7, 10, 26, 31] or during the first month after surgery,[1, 11, 21, 24, 27] although in a few cases it took two months[21, 22] to even one year.[21] In two cases[10, 21] apparently cured by surgery, a moderately severe arterial hyperten-

sion reappeared six months later. Episodes of tetany, muscular weakness or paralysis, and a paræsthesia vanish completely after operation. With the exception of Foye and Feitchmeir's patient[2] suffering from a carcinoma, all patients who underwent surgery seemed definitely cured.

(b) *Postoperative follow-up of patients who underwent bilateral, total or subtotal adrenalectomy*

Two patients were treated by subtotal bilateral adrenalectomy.[14, 27] In van Buchem's patient[14] blood pressure and plasma electrolyte values quickly returned to normal levels; polyuria and polydipsia disappeared in a few days. Urinary aldosterone excretion level dropped to 10.4 μg./24 hrs. The concentrating power of the kidney was completely restored in two weeks. With 25 mg. of cortisone per day, this patient was in clinical and biochemical balance.

Bartter and Biglieri's patient[27] did not receive any drug after surgery, in spite of the fact that his urinary aldosterone level was very low. This patient was asymptomatic with a diet containing 20 mEq. of sodium per day. However, when sodium intake was increased, arterial hypertension appeared and when sodium intake was decreased to below 20 mEq./day, orthostatic hypotension occurred.

This striking parallelism between sodium intake and arterial blood pressure was also noticed in Genest's patient.[30] Indeed, in this patient, who underwent a total bilateral adrenalectomy, the arterial blood pressure in general closely followed variations in sodium intake. With 12 g. of sodium chloride and 30 mg. of hydrocortisone per day, sodium balance remained negative. Administration of 50 μg. of 9α-fluoro-hydrocortisone per day markedly increased the blood pressure (diastolic pressure of 140 mm. Hg) without modifying the sodium balance which remained negative except on the first day of administration. However, when d,l-aldosterone acetate was added to this regimen, at a dosage of 150 μg. per day orally, sodium equilibrium was reached.

SUMMARY AND CONCLUSIONS

Primary aldosteronism may be characterized in the following manner:

1. Slightly more frequently observed in women than in men, with a peak age incidence between 30 and 45 years of age.

2. Caused in most cases by an adrenal adenoma; though in young patients adrenal hyperplasia is more frequent.

3. Arterial hypertension, polyuria, polydipsia, nycturia, episodes of muscular weakness or of paralysis and less often tetanic crises are the main clinical features.

4. Hypokalæmia is a constant finding and may or may not be accompanied by hypernatræmia and alkalosis.

5. Urinary specific gravity is low and remains so even after fluid deprivation or pitressin administration. Urinary pH is alkaline.

6. Urinary aldosterone level is usually well above the normal range but in some cases may, exceptionally, be normal at certain times during the course of the illness. The urinary excretion of the 17-hydrocorticosteroids and of the 17-ketosteroids is not modified.

7. Surgery is the only definitive treatment.

As arterial hypertension clinically indistinguishable from essential hypertension may be the sole manifestation of this disease, plasma potassium determinations should be carried out in *every* hypertensive patient, whatever his age. The primary importance of recognizing this disease is that it belongs to that small group of causes of hypertension where a permanent cure may be achieved by surgical intervention.

ADDENDUM

A few comments should be made on the status of primary aldosteronism before Conn's description of it in 1955, and since June 1958.

It is quite likely that many cases reported as "potassium-losing nephritis with periodic paralysis" before Conn's description was published were in fact based on patients suffering from primary aldosteronism. Cases reported by Milne and Evans[9, 35] and Russell *et al.*[15, 16] are striking examples of this. The two patients of Luft *et al.*[33] had histories very suggestive of primary aldosteronism; moreover, an adrenal adenoma was found at autopsy in the first case, and in the second one both adrenals were well above normal weight (total weight for both, 19 g.). However, blood pressure was normal in both patients (the authors even spoke of hypotension in the second case, which also had œdema). The patient of Kjerulf-Jensen *et al.*[32] similarly had a history very suggestive of primary aldosteronism but, as in Luft's cases, the blood pressure was normal and œdema was present (cyclical in that case). Wyngaarden's patient[34] suffering from malignant hypertension associated with marked renal impairment, urolithiasis and necrotizing arteriolitis had adrenals weighing 20.5 g.

The review of medical literature presented above ends at June 1958. To our knowledge four other cases have since been reported.[37-39] The interesting features of each are as follows:

1. Diabetes was associated with primary aldosteronism in the patient of Sorce and Whitstone.[39]

2. The first patient of Cortes *et al.*[38] had arterial hypertension as the sole manifestation of the disease for five years. In both patients reported by Cortes *et al.* glucose tolerance, abnormal before surgery, returned to normal after operation.

3. The 44-year-old patient of Hilton *et al.*[37] showed adrenal hyperplasia at autopsy. In this patient an ACTH intravenous infusion (25 units) resulted in an abnormal increase in the plasma hydrocortisone level without any change in urinary excretion of 17-hydroxycorticosteroids but with a significant and abnormal increase in the urinary excretion of the 17-ketosteroids during the first three days after the infusion.

SECOND ADDENDUM (before going to press)

Another case of primary aldosteronism due to adrenal hyperplasia in a 10-year-old boy came to our attention.[41] The syndrome in this child was due to bilateral adrenal hyperplasia chiefly involving the zona fasciculata. This child presented a very severe hypertension accompanied by several episodes of hypertensive encephalopathy but without retinopathy and papillœdema.

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CHIRURGIE DES VOIES BILIAIRES: ETUDE ANALYTIQUE DE 1534 CAS*

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INTRODUCTION

LA CHIRURGIE des voies biliaires est pratiquée très couramment dans les hôpitaux régionaux et dans les centres universitaires. D'importantes publications[1, 2, 4, 5, 6] ont rapporté et analysé récemment de longues séries de malades. En vue d'établir un parallèle, nous avons fait l'étude des dossiers de 1534 patients traités à l'Hôtel-Dieu St-Vallier de Chicoutimi. Tous les cas de chirurgie des voies biliaires classifiés dans nos archives depuis 1948 au 1er février 1959, ont été étudiés par les membres du service de chirurgie. Les informations pertinentes et les réponses à un questionnaire envoyé à tous nos patients ont été compilées. Sans l'aide d'appareil électronique, les moyennes et pourcentages ont été établis. Les résultats obtenus font la base de la présente étude.

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AGE ET SEXE

L'âge des patients varie de 15 jours à 78 ans (Fig. 1); la moyenne se situe à 41.8 ans. Nous avons traité 1374 patients de sexe féminin, dont l'âge est de 41.6 ans et 160 de sexe masculin, d'un âge moyen de 46.6 ans au moment de la chirurgie. On constate une prépondérance féminine importante puisque la proportion s'établit à 9 pour 1. Elle diffère considérablement de celle rapportée dans la littérature. Dans la série d'Adams,[1] elle s'établit à 3 pour 1, à 3.5 pour 1 dans la série de Babcock[6] et à 2 pour 1 dans celle de Colcock.[2] La prépondérance féminine dans notre série est due, croyons-nous, au facteur grossesse. En effet, si 247 femmes étaient nullipares, par contre 1127 avaient eu une moyenne de 6.5 grossesses et 16 parmi elles étaient enceintes au moment de l'intervention.

ANATOMO-PATHOLOGIE (Tableau I)

La cholécystite chronique lithiasique est sans contredit la lésion la plus fréquente: 1350 cas. Par ailleurs, 184 patients, soit 8.7%, étaient porteurs d'une cholécystite aiguë. Ce chiffre est variable selon les cliniques: il est de 5% dans la série d'Adams,[1] de 19% dans celle de Babcock[6] et de 9.8% dans celle de Colcock.[2] La discordance de ces différentes séries peut reposer sur le fait d'une interprétation variable des pathologistes. Pour les

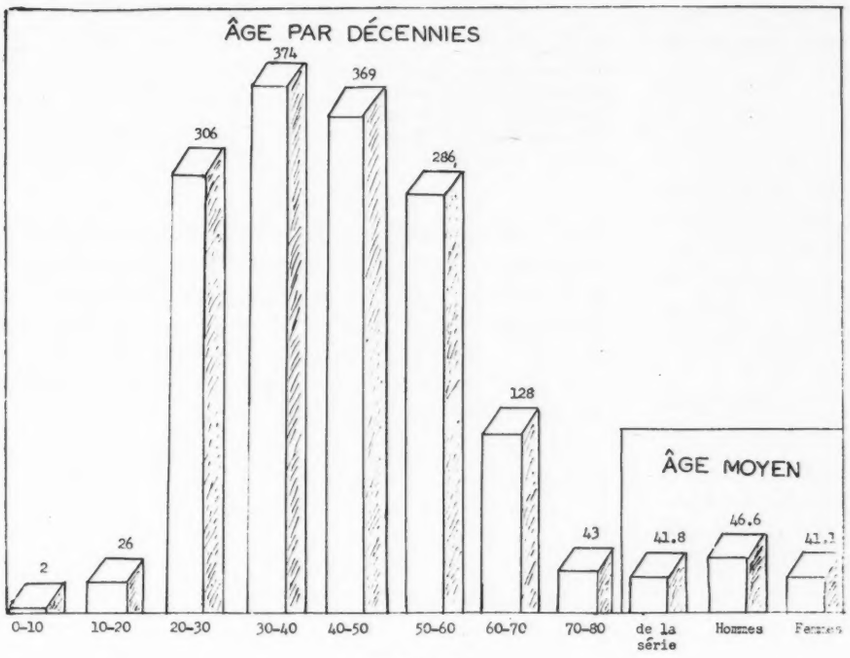

Fig. 1

fins de notre statistique, les rapports anatomo-pathologiques indiquant "cholécystite aiguë en voie de refroidissement" ont été considérés comme des cholécystites chroniques.

TABLEAU I.—PATHOLOGIE BILIAIRE

Cholélithiase	1307
Cholécystite aiguë	184
Mucocèle	15
Sténose du sphincter d'Oddi	10
Vésicule fraise	6
Cancer de la vésicule	5
Cancer du cholédoque	2
Malformation de la vésicule	1
Névrome du cystique	1
Obstruction congénitale du cholédoque	1
Vésicule normale	2

On a trouvé une sténose du sphincter d'Oddi chez 10 patients. De plus, on a noté sept cancers, dont cinq de la vésicule et deux du cholédoque. Notre proportion de 0.45% est supérieure à celle d'Adams[1] (0.3%), mais de beacoup inférieure à celles rapportées par Walters[4] (1.5%) et par Babcock[6] (4%). Ces variations s'expliquent encore selon que le pathologiste considère comme biliaire ou pancréatique, certains cancers de l'ampoule de Vater. Nous n'avons qu'un seul de ces derniers, que nous incluons dans la pathologie associée.

Pathologie associée

Chez 383 de nos malades, soit 25% du total, il existait une pathologie associée de nature à influencer soit la chirurgie pratiquée, soit l'évolution post-opératoire. Ces processus pathologiques sont énumérés au Tableau II. L'association d'un ulcère peptique aux troubles biliaires est bien connue. Nous l'avons rencontrée 24 fois. Les constatations opératoires ont mis en évidence une pancréatite associée dans 18 cas seulement. Un fait plus important, croyons-nous, est l'association d'un cancer extra-biliaire dans 25 cas. Ainsi donc, 1.6% des porteurs d'une lithiase souffrent également d'un cancer extra-biliaire. La majorité de ces cancers sont situés dans le tractus digestif. Il importe donc de faire une investigation complète avant d'envisager une cholécystectomie.

Chez 95 de nos patients, il y avait atteinte à l'appareil cardio-vasculaire. Malgré les progrès de l'anesthésie, de la chirurgie et des soins postopératoires, six de nos décès sont attribuables à ce facteur. Ici encore, une investigation s'impose, surtout si on considère qu'une colique hépatique peut masquer un infarctus récent, et qu'une opération purement élective à ce moment peut être désastreuse pour le patient.

TABLEAU II.—PATHOLOGIE ASSOCIÉE (383 CAS)

Hypertension artérielle: 45	Hernie: 24
Insuffisance coronarienne: 21	Goitre: 7
Sténose aortique: 2	Prolapsus génital: 19
Insuffisance mitrale: 3	Kyste de l'ovaire: 28
Infarctus: 10	Kyste tordu de l'ovaire: 3
Fibrillation auriculaire: 1	Tuberculose pulmonaire: 15
Sténose mitrale: 2	Lithiase rénale: 7
Myocardite: 6	Pleurésie: 1
Communication inter-ventriculaire: 1	Rein polykystique: 1
	Rein en fer à cheval: 1
Cardiopathie: 2	Diverticulose du sigmoïde: 2
Cancer (25)—œsophage: 1	Pyélite: 8
estomac: 3	Sclérose en plaques: 1
lèvre: 1	Appendicite aiguë: 6
côlon: 4	Abcès du poumon: 1
sigmoïde: 2	Surcharge glycogénique: 1
rectum: 1	Placenta prævia: 1
sein: 1	Carcinoïde de l'appendice: 1
ovaire: 2	Obstruction intestinale: 1
utérus: 2	Emphysème pulmonaire: 3
col: 1	Hémangiome du foie: 1
rein: 1	Kyste du foie: 2
pancréas: 4	Péritonite: 1
dysembryome malin: 1	Hépatite: 2
	Salpingite: 3
mélano-blastome: 1	Mastite: 2
	Syphilis: 1
Fibrome: 44	Polype du col: 2
Cirrhose: 11	Polype de l'estomac: 1
Ulcère peptique: 24	Adhérences: 1
Pancréatite aiguë: 7	Epilepsie: 1
—chronique: 11	Fracture: 1
Diabète: 12	Malaria: 1
Diverticule de Meckel: 5	Hémorroïdes: 3
—du duodénum: 3	Tumeur de la rate: 1

Symptômes

Nous n'insisterons pas sur les symptômes classiques de la lithiase. Soulignons que 183 patients, soit 11% du total, étaient porteurs d'ictère à l'admission. Dans les séries d'Adams[1] et de Colcock,[2] toutes deux de la même clinique, 18% et 18.8% respectivement étaient ictériques à

l'admission. Des crises de colique hépatique sont signalées chez 1368 de nos patients, remontant en moyenne à 3.2 ans.

Examens pré-opératoires

Sur 583 électrocardiogrammes, 222 présentaient des anomalies, dont la plupart étaient mineures et attribuables à des phénomènes réflexes d'origine biliaire. Par contre, des infarctus récents ont été décelés et dans ces cas l'intervention a dû être retardée. Le cholestérol sanguin est de 2.32 g./l. en moyenne, chez les 452 patients où il a été recherché. Nous considérons cet examen sans signification importante.

On a pratiqué 1529 examens radiologiques, soit 1263 cholécystographies et 266 cholangiographies. Une lithiase a été décelée 965 fois et dans 266 cas, la vésicule était exclue. Les examens dans 32 cas ont été interprétés comme normaux ou simplement douteux.

TABLEAU III.—CHOLANGIOGRAPHIE (266 CAS)

Per-opératoire, normale	14
Per-opératoire, montrant lithiase	5
Post-opératoire, normale	237
Post-opératoire, montrant lithiase	5

La cholangiographie per-opératoire a été pratiquée seulement 19 fois, et interprétée comme normale 14 fois. Chez 247 patients, une cholangiographie post-opératoire a été faite et cinq fois elle a décelé une lithiase du cholédoque (Tableau III).

Nature de l'intervention

La cholécystectomie simple a été de beaucoup l'opération la plus pratiquée. Une cholécystostomie a été pratiquée chez 30 patients, soit 1.9% de la série. Les chiffres comparatifs s'établissent à 0.54% dans la série d'Adams,[1] à 0.5% dans celle de Colcock,[2] à 0.4% dans celle de Walters,[4] à 3% dans celle de Zollinger.[3] Nous sommes d'accord avec Walters[4] sur l'opportunité de cette opération, quand des conditions locales ou de facteurs extra-biliaires rendent une chirurgie d'exérèse trop dangereuse.

L'excision d'un moignon cystique restant a été pratiquée chez trois patients.

Les dix patients qui souffraient de sténose du sphincter d'Oddi ont subi une sphinctérotomie transduodénale. Parmi les opérations moins fréquentes, notons quatre cholédocho-duodénostomie, soit pour sténose congénitale ou rétrécissement cicatriciel. Une cholécysto-duodénostomie a été faite pour cancer de la tête du pancréas. La même cause a porté le chirurgien à faire une cholécysto-gastrostomie et trois cholécysto-jéjunostomies. On rapporte aussi un cas d'hépatico-jéjunostomie. Le cholédoque a été exploré 318 fois, soit chez

TABLEAU IV.—CHOLÉDOCHOTOMIE (318 CAS)

Lithiase	139
Cancer	2
Sténose du sphincter	10
Obstruction congénitale	1
Dilatation sans lithiase	179
Sténose cicatricielle	2

20.6% de nos patients. Nos indications de cholédochotomie reposent sur des critères universellement acceptés, et nos constatations sont résumées au Tableau IV. Une lithiase a été mise en évidence dans 45% des explorations. Un tube de Kehr ou de Cattell a été utilisé 314 fois, et quatre cholédoques ont été refermés sans drainage.

La fréquence des cholédochotomies varie selon les centres. Elle s'établit à 45.7% dans la statistique d'Adams,[1] à 24% dans celle de Babcock,[6] à 33% dans celle de Zollinger,[3] à 23% dans celle de Walters,[4] à 36.7% dans celle de Colcock.[2] Bartlett et Waddell[5] ont rapporté récemment une série de 1000 cholédochotomies, mais ils ne citent pas la proportion de cette exploration par rapport aux cholécystectomies. Il est remarquable de signaler que plus on observe rigoureusement les critères de cholédochotomie, plus le pourcentage d'exploration positive s'élève. Ainsi notre série montre 45% de lithiases, celle d'Adams[1] 36%, celle de Babcock[6] 51.5%, celle de Colcock[2] 28.5% et celle de Walters[4] 47%. En somme, cette exploration doit être réservée à ceux qui ont des indications bien définies. Les patients consultent maintenant plus tôt dans l'évolution de leur maladie et les indications d'explorer le cholédoque deviennent moins fréquentes. Soulignons à cet effet que les séries d'Adams[1] et de Colcock,[2] qui proviennent toutes deux de la même clinique, mais à des périodes différentes, ont montré une diminution des cholédochotomies de 45.7% à 36.7%.

Chirurgie associée

Si on considère la pathologie extra-biliaire, plusieurs indications se posaient d'étendre les manœuvres opératoires au-delà du carrefour hépatique. Nous n'avons pas hésité à le faire quand l'état du patient s'y prêtait. Le Tableau V montre le détail des opérations associées. En plus

TABLEAU V.—CHIRURGIE ASSOCIÉE

Gastrectomie	10
Gastrectomie et hépatectomie partielle	1
Gastrectomie et diverticulectomie	1
Hernioplastie	10
Hystérectomie	17
Pancréatectomie et gastrectomie	1
Abdomino-périnéale	1
Périnéoplastie	5
Mastectomie	1
Colectomie	1
Césarienne	1
Gastrotomie	5
Néphrectomie	1
Suture d'ulcère perforé dans la vésicule biliaire	4
Ovariectomie	14
Gastro-entérostomie	1

de l'appendicectomie complémentaire, plusieurs opérations majeures ont été pratiquées au cours de la chirurgie biliaire. L'association de gastrectomies (10), d'hystérectomies (17) ou d'hernioplasties (10) n'a pas augmenté la morbidité, ni la mortalité opératoire.

Corrélation radiologique et chirurgicale

Le radiologiste a affirmé la présence de lithiase chez 965 patients et ce diagnostic s'est avéré correct 944 fois, soit un pourcentage d'exactitude de 97.7%, qui peut se comparer avec celui de 97.6% rapporté par Adams.[1] Par contre, chez 18 patients où une cholécystographie avait suggéré une lithiase, l'exploration chirurgicale a démontré 14 cholécystites non lithiasiques et quatre vésicules normales.

TABLEAU VI.—VÉSICULE EXCLUE (266 CAS)

Lithiase	141
Cholécystite aiguë	106
Mucocèle	7
Cancer de la vésicule	4
Vésicule fraise	2
Cirrhose	1
Granulome lipophagique	1
Cancer métastatique	1
Cancer du cholédoque	1
Sténose du cholédoque	1
Adhérences	1

Dans 266 cas, soit 21% des cholécystographies, la vésicule était exclue. Ce pourcentage s'établit à 21.6% dans la série d'Adams[1] et à 18.3% dans celle de Colcock.[2] Nos vésicules exclues représentaient des cholécystites chroniques lithiasiques (141) et des cholécystites aiguës (106) (Tableau VI). En aucun cas, une vésicule exclue fut trouvée normale. L'exclusion avait pour cause un cancer du cholédoque, un cancer métastatique et quatre cancers de la vésicule. La vésicule exclue était donc la signature d'un cancer dans 2.2% des cas.

Corrélation pathologique et chirurgicale

Le diagnostic opératoire de cholécystite aiguë a été porté 148 fois. Le pathologiste a différé d'opinion dans 22 cas. Par contre, il a porté 52 diagnostics de cholécystite aiguë sur des lésions que le chirurgien avait considéré différemment. A deux reprises, les lésions évidentes ont permis au chirurgien d'affirmer le diagnostic de cancer; l'étude microscopique en a dépisté cinq autres.

Evolution post-opératoire

L'appréciation d'un traitement chirurgical ne peut se faire que par l'étude des résultats obtenus. Il convient d'étudier les suites immédiates de l'opération et le comportement éloigné des patients. L'évolution des résultats immédiats doit être envisagée suivant la morbidité, la mortalité, les réinterventions et les réhospitalisations.

TABLEAU VII.—COMPLICATIONS

Infection aiguë de la paroi	13
Cholépéritoine	12
Eventration	9
Atélectasie	7
Granulome de la paroi	6
Calcul restant du cholédoque	5
Phlébite	4
Hémorragie	3
Ictère transfusionnel	3
Sténose cicatricielle du cholédoque	2
Pleurésie	1
Plaie de lit	1
Acidose	1
Coma hépatique	1
Fistule biliaire	1
Choc	1
Parotidite	1
Insuffisance rénale aiguë	1
Hématome de la paroi	1
Céphalée post-rachidienne	1
Cholédocite	1
Angiocholite	1
Hématome pelvien	1
Embolie pulmonaire	1
Thrombose hémorroïdaire	1

(a) *Morbidité.*—Des complications sont survenues chez 5.3% de nos patients. Les unes sont sans importance, les autres ont entraîné des réinterventions ou des décès. Parmi les plus fréquentes, notons 13 infections de la paroi, 12 cholépéritoines, 9 éventrations et 7 atélectasies pulmonaires. Nous n'avons eu qu'une seule embolie pulmonaire et celle-ci ne fut pas fatale. Dans la série d'Adams,[1] on note 6.5% de complications et huit embolies pulmonaires, dont deux mortelles (Tableau VII).

TABLEAU VIII.—MORTALITÉ—1.6%

Cancer avec métastases	7
Infarctus	6
Cirrhose biliaire	3
Insuffisance rénale	3
Choc surrénalien	1
Eventration répétées	1
Hépatite	1
Granulome lipophagique	1
Pancréatite aiguë	1
Indéterminé	1

(b) *Mortalité.*—Nous avons considéré comme mortalité opératoire, tout décès survenant au cours de l'hospitalisation, quelle qu'en soit la durée. Vingt-cinq patients sont morts, soit un pourcentage de 1.6. Les causes de décès sont énumérées au Tableau VIII. On constate que le cancer et l'infarctus du myocarde sont responsables de plus de la moitié des décès. Parmi les autres, signalons trois cas de cirrhose biliaire et trois cas d'insuffisance rénale aiguë. Nous n'avons à déplorer aucun arrêt cardiaque, alors que cet accident est survenu trois fois dans la série de Babcock.[6] Ce dernier rapporte une mortalité opératoire de 3.4%. Adams[1] en rapporte 0.9% et Colcock[2] 1.2%. Walters[4] signale 25 décès dans sa série de 1437 patients, soit une proportion de 1.7%.

(c) *Réinterventions et réhospitalisations.*—Chez 2.3% de nos patients, nous avons dû réintervenir. Les indications principales furent: calculs restants

du cholédoque (4), cholépéritoines (12), éventrations (9), granulomes de la paroi (6) ou hémorragies post-opératoires (3). Quinze patients, soit 1% du total ont été réhospitalisés pour une nouvelle opération. Six d'entre eux ont une exploration du cholédoque, 3 une cholécystectomie, 2 une réparation de hernie post-opératoire et 1 une dilatation du sphincter d'Oddi. Une fistule biliaire a nécessité un traitement chirurgical. Nous n'avons eu que deux rétrécissements connus du cholédoque, l'un traité par cholédocho-duodénostomie, l'autre par cholédocho-cholédochostomie. Il est possible que certains rétrécissements nous aient échappé ou aient été traités ailleurs.

EVOLUTION ÉLOIGNÉE

Pour établir l'évolution éloignée de nos patients, nous avons adressé 1483 questionnaires: 77% sont revenus. L'étude analytique de ces réponses nous fournit un motif d'encouragement puisque 89% des patients sont satisfaits de l'opération. Parmi les malades non satisfaits, 109 accusent des crises, 79 doivent suivre un régime, 12 présenteraient à la fois des crises et de l'ictère, tout en suivant leur régime. Par contre, sept ne font ni crise, ni ictère, ne suivent aucun régime et ne sont pas satisfaits. Ce mécontentement provient probablement de facteurs extra-anatomiques. Une entrevue personnelle aurait précisé davantage la nature des crises. Un malade opéré pour une vésicule a souvent tendance à attribuer tous ses malaises subséquents à son opération.

Evaluation éloignée des cholécystostomies

Parmi 30 patients, 13 n'ont pas donné de réponse au questionnaire et cinq sont décédés de causes impossibles à déterminer. Deux ont subi une cholécystectomie subséquente. Un patient non réopéré continue à faire des crises et de l'ictère. Neuf sont satisfaits et sans symptôme.

Evaluation éloignée des sphinctérotomies

De 10 patients, huit sont satisfaits et parmi eux un seul fait encore des crises. Un patient n'a pas donné de réponse et un autre est décédé.

Evaluation éloignée des cancers

Parmi nos sept patients, cinq sont décédés en moins de six mois. Une malade opérée en 1953 et une autre opérée en mai 1958 se disent satisfaites de leur opération.

Evaluation éloignée des cholangiographies post-opératoires montrant une lithiase

Cinq patients ont quitté l'hôpital avec une lithiase cholédocienne confirmée par une cholangiographie post-opératoire. Dans un cas une réintervention a été faite. Les autres ne font pas d'ictère, sont satisfaits de leur opération et un seul fait des crises.

Evaluation éloignée des cholédochotomies (Tableau IX)

Nous avons vu que 318 malades qui ont eu une exploration du cholédoque; l'évolution de ces malades nous paraît extrêmement instructive. Dans 139 cas, l'exploration a permis l'extraction de calculs et nous avons reçu 111 réponses de ces patients: 23 ont fait des crises et 2 ont présenté de l'ictère, 77 ne suivent aucun régime. Chez 179 malades, l'exploration a été négative. Nous avons reçu 134 réponses: 36 font des crises, 15 accusent de l'ictère et 71 ne suivent aucune diète. En somme, les malades qui ont subi une exploration fructueuse du cholédoque ont une évolution plus favorable. Il semble que dans ces cas, le traitement s'attaque à la cause même des symptômes. Par contre, le malade qui subit une cholédochotomie suivant les critères admis et chez qui on ne retrouve pas de lithiase, peut avoir des calculs difficiles à percevoir ou présenter définitivement une pathologie différente. La radio-manométrie pourrait peut-être, dans ces cas, discerner une dyskinésie cholédocienne ou un examen plus attentif du pancréas déceler des lésions inflammatoires minimes.

TABLEAU IX.—CHOLÉDOCHOTOMIE: EVALUATION ÉLOIGNÉE

Lithiase découverte	139	Absence de lithiase	179
Réponses	111		134
Ictère	2		15
Crises	23		36
Suivent une diète	34		63
Satisfaits	102		114
Décédés	3		7

CONCLUSIONS

Une série de 1534 cas de chirurgie des voies biliaires a été présentée.

Des complications sont survenues dans 5.3% des cas et la mortalité opératoire a été de 1.6%.

Le cholédoque a été exploré chez 20.6% de nos patients, décelant une calculose dans 45% des explorations.

Une pathologie extra-biliaire était présente chez 25% de nos patients.

L'intervention a satisfait 89% des opérés.

L'utilisation plus fréquente de la radio-manométrie pourrait peut-être améliorer nos résultats, sans augmenter la morbidité ou la mortalité opératoire.

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SUMMARY

A survey of 1534 consecutive cases of biliary tract surgery at the Hôtel-Dieu St-Vallier of Chicoutimi is presented. Data concerning age, sex and parity are included. The ratio of females to males was 9 to 1. The authors believe that this unusually high ratio can be accounted for by the high pregnancy rate in this part of Canada, the average female patient having had 6.5 full-term pregnancies before operation. The major lesions involved included cholelithiasis (1350 cases); acute cholecystitis (184 cases), stenosis of the sphincter of Oddi (10 cases) and cancer (7 cases). Extrabiliary lesions were present in 25% of the cases, and extrabiliary cancer was present in 25 cases.

Choledochotomy was performed in 20.6% of the cases and stones were found in 45% of the cases explored. Postoperative morbidity occurred in 5.3% of the cases and the operative mortality was 1.6%. Follow-up data on 77% of the patients show that 89% of them are satisfied with their operation. The authors emphasize the importance of operative cholangiography and careful pancreatic examination in order to decrease the incidence of the so-called "postcholecystectomy syndrome".

FOLLOW-UP STUDY ON 311 CASES OF PREFRONTAL LEUCOTOMY*

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PREFRONTAL leucotomies were performed at this hospital between the years 1944 and 1957. Our previous report in 1953[1] dealt with our experiences up to that time. During 1958, we made a complete survey of all our patients—both those remaining in hospital and those discharged to the community. This paper reports the results of the survey.

SPECIFIC AIMS OF THE SURVEY

1. To bring the records of all cases up to date.
2. To make an assessment of each case and classify the patient as recovered, improved or unimproved at six months, two years, and five years after leucotomy.
3. To make a similar assessment of each case and classify the patient as receiving: (a) benefit from the operation; (b) overall benefit but with some undesirable effects; (c) little or no benefit from the operation.
4. To determine the incidence of postoperative seizures over a long period.

METHOD

Special records had been kept on all these patients, both preoperatively and postoperatively, as long as they were in the hospital. The recording included extensive use of the Henderson-Schultz modification of the Gardner behaviour chart. For patients out of hospital, one of the authors (L.H.) travelled over 8000 miles to visit most of them at their homes during the summer of 1958. For a few who could not be reached, correspondence was used to supplement information already available. Definite and reliable information was available on all of the 311 patients for each of the assessment dates that applied; 299 were still alive in 1958; and 233 of these were in hospital. Fifty-five of those out of hospital were seen by L.H.; direct correspondence was carried on with eight, or with their relatives. In three cases no contact was made in 1958, but previous contact had supplied the necessary information in each of these cases. We had 311 cases for evaluation at six months after operation, 308 at two years, and 242 at five years.

The information collected and the assessments made were entered on hand-punched cards, and tables were prepared from which probabilities were calculated to give comparable figures for the different assessment periods.

TABLE I.—ALL CASES CLASSIFIED AS RECOVERED, IMPROVED, UNIMPROVED AND DECEASED

	6 months postoperative		*2 years postoperative*		*5 years postoperative*	
	No.	*Probability*	*No.*	*Probability*	*No.*	*Probability*
Recovered	14	.05	15	.05	15	.06
Improved	144	.46	119	.39	95	.39
Unimproved	146	.47	166	.54	120	.50
Deceased	7	.02	8	.02	12	.05
Total	311	1.00	308	1.00	242	1.00

When assessing the patient as recovered, improved or unimproved, no account was taken of the possible influence of other forms of treatment. Other treatments received subsequent to leucotomy influenced these results in some cases and this is seen by comparing Tables I and II.

TABLE II.—CASES CLASSIFIED AS RECEIVING BENEFIT, BENEFIT WITH UNDESIRABLE EFFECTS, LITTLE OR NO BENEFIT, AND DECEASED

	6 months postoperative		*2 years postoperative*		*5 years postoperative*	
	No.	*Probability*	*No.*	*Probability*	*No.*	*Probability*
Benefit	91	.29	59	.19	37	.15
Benefit with undesirable effects	85	.27	57	.18	49	.20
Little or no benefit	128	.42	184	.60	144	.60
Deceased	7	.02	8	.03	12	.05
Total	311	1.00	308	1.00	242	1.00

*Final report on Federal Health Research Project No. 606-5-84, from the Brandon Hospital for Mental Diseases, Brandon, Man.

TABLE III.—RESULTS WITH RESPECT TO DIAGNOSIS

Diagnosis	Total cases	Probability of showing benefit from leucotomy with or without undesirable effects: 6 months postoperative No.	6 months postoperative Probability	2 years postoperative No.	2 years postoperative Probability	5 years postoperative No.	5 years postoperative Probability
Schizophrenic catatonia	81	81	.61	81	.44	64	.35
Schizophrenic paranoia	118	118	.56	118	.36	92	.27
Schizophrenic other	59	59	(.53)	58	(.34)	46	(.43)
Total schizophrenia	258	258	.56	257	.37	202	.34
Manic-depressive	22	22	(.86)	21	(.71)	18	(.56)
Other psychosis	31	31	(.32)	30	(.20)	22	(.36)
All cases	311	311	.56	308	.37	242	.36

NOTE:—Probabilities in brackets cannot be considered as below the .05% level of significance for most comparisons.

The classification "recovered" was based on the opinion of the hospital psychiatrists that the patient had recovered from his psychosis; his subsequent history indicated that, for a time at least, his adjustment was equivalent to, or better than, that reported before his leucotomy. If a patient showed definite improvement over his preoperative condition, he was classed as improved.

TABLE IV.—RESULTS WITH RESPECT TO LENGTH OF HOSPITALIZATION

Time in hosp. preoperative	Probability of being out of hospital: 6 months postoperative	2 years postoperative	5 years postoperative
Less than 2 years	.35	.37	.37
2 - 5 years	.06	.19	.16
Over 5 years	.06	.14	.08

Patients who showed desirable changes after the operation and retained them through the various evaluation times without showing any undesirable effects were classified as receiving benefit. If, however, the patients showed undesirable effects such as seizures, but the latter were not severe enough to destroy all the value received from the good effects, the patient was classified as receiving overall benefit but with some undesirable effects.

We realize that these are subjective methods of evaluation, but they are still the best available to us, and we believe that it is better to measure with the means available than not to measure at all.

RESULTS

The results of the investigation are tabulated in Tables I to IV.

CONVULSIONS AFTER LEUCOTOMY

To date our records show that of the 311 patients, 50 (16%) have had seizures after the operation. Seven had only one seizure. The others had more than one, but the seizures in most cases were easily controlled with medication. Some, however, had persistent seizures in spite of medication, and in three cases they were completely incapacitated by them for some years. Most seizures occurred in the first year after operation. Others experienced their first seizures as many as four and five years after the operation. Unlike Barahal,[2] we have no record of a patient's death occurring as a result of status epilepticus. Several of our patients have gone into status epilepticus but they have been brought out successfully to date.

DEATHS

A total of 12 patients have died. Seven of these deaths could be considered due to the leucotomy or postoperative complications. The other five deaths occurred several years (2-5) after the operation and were attributed to other causes. The probability of death due to the operation works out at .022. This is considerably lower than reported by Barahal, but is still high enough to point out the serious consequences that can result from this operation.

YEARS FROM LEUCOTOMY TO DISCHARGE

Of the 311 patients, a total of 96 have been discharged to date, but 29 of these have been readmitted. The probability of discharge within two years of the operation works out at .25, while the probability of readmission within one year of discharge is .16.

TABLE V.—AGE AT LEUCOTOMY

Age at leucotomy	Evaluation period: Six months Total cases	Six months Received benefit	Six months Probability	Two years Total cases	Two years Received benefit	Two years Probability	Five years Total cases	Five years Received benefit	Five years Probability
0-24 years	32	19	.59	32	10	.31	27	7	.24
25-34 "	106	59	.55	105	34	.32	87	28	.32
35-44 "	92	45	.50	90	37	.41	64	24	.36
45-54 "	46	33	.71	45	22	.49	36	17	.42
55- "	28	17	.53	28	12	.53	21	10	.48

REPEAT LEUCOTOMIES

Twenty-six patients underwent a second leucotomy. On the whole the results were unsatisfactory. Six months after operation only six were classed as having received benefit. At two years this number was reduced to four. Only 11 of these second leucotomies were evaluated at five years. Of these patients, nine were classed as having received no benefit while two were classed as having received benefit.

AGE AT LEUCOTOMY

Patients in the 45-54 age group at the time of leucotomy had a significantly better result at the six-month evaluation period than all other age groups. At the two-year and five-year evaluation periods, results were significantly better for all patients aged over 45 than for those under 45 (see Table V).

DISCUSSION

Our methods have given a picture of the results of the leucotomies performed at this hospital. The results as measured by the two classifications do differ (compare Tables I and II), although they both show the same general pattern, namely, with the best results six months after operation and a falling off at the two-year and again at the five-year evaluation. We have no doubt that the differences are due to the following: (1) failure of some patients to improve after leucotomy, but with later improvement due to other causes; (2) original improvement of some patients, apparently as a result of leucotomy, with failure to hold this improvement but later further improvement due to other causes.

After five years, the probability that 35 out of 100 cases will receive benefit is the best single indicator of the value of leucotomy in our opinion.

We have improved on most reports of this type by using standard time-periods for all our evaluations. This is one criterion which can be used to advantage in all attempts to evaluate the results of psychiatric treatment.

With respect to seizures following leucotomy, our probability of seizures in 16 per 100 cases may be regarded as a minimum. We have not had the high incidence of 25 per 100 reported by some authors.[4]

We believe that our results have justified leucotomy in treatment of patients during the years 1944-1956. New methods of treatment in use today have reduced the number of patients requiring leucotomy, but we maintain our original premise:[1] "Where all other forms of treatment fail, leucotomy may be considered."

CONCLUSIONS

Results of 311 leucotomies were analyzed six months, two years and five years after the operation. The best single statistic indicating the results is, in our opinion, the probability that five years after operation 35 out of 100 patients can still be classed as having received benefit from the operation.

We wish to acknowledge the assistance received for this project through the Federal Mental Health Research Grants. We also wish to thank all members of the staff of the Brandon Hospital for Mental Diseases for their assistance in making this project possible.

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RÉSUMÉ

On a revu en 1958 les 311 malades ayant subi une leucotomie préfrontale à l'hôpital des maladies mentales de Brandon de 1944 à 1957. Faute de mieux, les résultats furent évalués selon la classification: "guéri, amélioré ou non amélioré". La guérison d'après l'évaluation psychiatrique consiste en une disparition, même temporaire, de la psychose; l'amélioration ou l'absence d'amélioration sont jugées par comparaison avec le comportement préopératoire du malade. Vu les difficultés qu'aurait présenté leur interprétation, les autres formes de traitement n'ont pas été prises en considération dans l'évolution des malades. On nota des crises convulsives postopératoires, surtout au cours de la première année, dans 16% des cas. La plupart du temps cette complication fut aisément controlée par une médication anticomitiale. Sept des douze morts sont attribuables à l'intervention ou à des complications postopératoires. Après avoir été opérés, 96 malades reçurent leur congé, mais 29 d'entre eux durent être admis de nouveau. Chez les 26 soumis à une seconde leucotomie, les résultats dans la plupart des cas n'ont pas été satisfaisants. En général, les meilleurs résultats semblent être obtenus chez les malades âgés de 45 à 54 ans. La plus grande amélioration s'est vue à l'évaluation de six mois; on nota une certaine diminution à deux ans qui devint encore plus marquée à cinq ans. La recoupe des statistiques permet d'affirmer que cinq ans après l'opération, 35% des malades conservent encore un certain degré d'amélioration de la leucotomie préfrontale.

A THOROUGH OVERHAUL

"The laity are equally prone to adopt comfortable concepts. One of the most irrational and comforting delusions held by the layman is the notion that his body is really a kind of motor-car. 'I feel much better now you've given me a thorough overhaul' is a remark I have heard on many occasions. Doctors are often guilty of nourishing this delusion when they make remarks such as 'You'd better come in for a complete check-up.' Behind all this lies the delusion that the physician is likely to remedy defects as he finds them—applying a little oil here, fitting a replacement there, and possibly clearing out a blocked pipe. Business men and high-up executives like to have 'complete check-ups' at regular intervals, when they can go into a clinic for a lot of expensive investigations. This emphasizes their importance ('we always have the Rolls decarbonized every 5000 miles to keep it in tip-top condition, but we don't bother about the utility van'), and also it gives them a feeling of security, as they come out of the clinic rejuvenated by a comforting illusion of physical decarbonization. But the analogy with motor-car engines is false, and the only point where it applies is that when the trouble is very serious the patient is likely to be returned to his Maker."—R. Asher, *Lancet*, 2: 417, 1959.

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DEPRESSIVE REACTIONS IN THE AGED CHRONICALLY ILL

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FROM MANY sources come data that more people than ever before are reaching old age, an old age often impaired by physical and mental illness. Further, statistical trends are indicative of a continuing rise in the proportion of senior citizens within our population. Medical advances have much to do with the sharply increased life span within this century, but this very longevity has brought a set of new and challenging problems. The issues related to old age pose medical, social, psychological, economic and cultural problems, so that the solutions must be sought not alone or only by medicine, but in co-operation with all other disciplines interested in the field of interpersonal relations.

One aspect of this population change and the impact on medical problems is underlined in a recent paper by Gal.[1] He points out that of all patients admitted for the first time to New York State hospitals, the proportion of those over 65 years of age comprised 13.3% in 1913, whereas in 1955, those over 65 years totalled 40%. Such a gross population shift is of importance to physicians, to sociologists, to industrialists and others. Previous impressions about old age, retirement and many related problems urgently require revision. Increasing attention to this area by a multi-disciplinary approach will undoubtedly increase our fund of knowledge and of understanding, and will provide clues towards solution of these problems, both old and new.

The normal physiology of the ageing process is still uncharted in many areas. Groen[2] has described biological ageing as a biochemical process originating in the central nervous system, particularly relating to the diencephalon. The latter part of the central nervous system is subject both to the somatic senescent processes of involution and ischæmia, and to the influence also of the functional processes connected with the life experience of the individual. Involutional, vascular and psychological influences will, in the course of years, affect the condition of this part of the cerebrum, from which, along neural and hormonal pathways, the phenomenon of ageing appears in the remainder of the organism. According to this hypothesis, the functions of the diencephalon regulate the fundamental processes during life, and the rate and duration of life itself. This general hypothesis is attractive from a number of standpoints, but must await validation from the emergence of further data derived from the study of ageing persons, both healthy and ill.

One recent study reports upon personal attitudes towards ageing, and the influence of ageing on personal attitudes. Neugarten[3] explored the attitudes of a middle-aged group towards growing older, and his survey indicated that fears of the future and of old age are especially associated with fears of dependency, and with loss of health and of income. Such fears are unrelated to actual chronological age, but rather reflect intrapsychic and culturally determined orientations of those in the study.

The problem of defining ageing in sociological terms was explored by Havighurst.[4] He offered as a definition that a person is aged only when he is too old to carry on some important function as measured, for example, by the sharply decreased ability to work. Growing old implies a loss of status and prestige in a given society, and involves also a loss of social competence. The biological functioning of the body falls off more rapidly than its social functioning, so that some people may continue to function normally in spite of severe cerebral damage due to ageing. He suggests that modern society can give greater fulfilment to the ageing by (1) redirecting the emphasis from work as the major symbol of social competence, to leisure, home, family, and citizenship roles, and (2) by supporting medical research to find new ways of maintaining health and vigour, and thus preserve the biological basis for social competence.

Still[5] emphasized that boredom was the main psychosocial disease of ageing. Enforced leisure due to premature retirement and increasing automation has created a problem which he suggests can only be solved by developing greater skills in creative living through renewed education. Beckman[6] reported a careful sociological survey which supported the impression that the capacities for adjustment decrease with increasing age and are similarly influenced by inadequate income, limited education, and diminishing social contacts.

Klopfer[7] has been concerned with more personalized data in studying the psychological stress of old age. He reports that a narcissistic trauma results from the decrease of actual capacity and from the changed relationships of the aged to other segments of society. Pathological reactions seem to be the result of a loss of self-esteem, either on a functional or organic basis. This loss of self-esteem produces anxiety which is alleviated by adaptive and maladaptive techniques such as denial, projection or conversion. Most studies demonstrate that ageing does produce deterioration of various kinds which makes for increasing difficulties in adjustment. Projective tests show that the aged are slower, less productive and less efficient than younger persons. Emotional controls are more brittle, and egocentric lability or complete inhibition is to be found. Self-esteem is threatened by decrease of actual capacity and depends on how useful one feels in relation to the environment. Continuing activity and particularly identification with the young are important

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determinants of optimism. Psychoanalytical studies emphasize that ageing does involve a narcissistic injury, and there is a revival of old anxieties to which the defensive reaction is amnesia. Efforts to strengthen the ego of the aged individual are effected through encouragement, support, provision of increased opportunity for activity, and if possible, identification with younger persons.

There is considerable and progressive revision of previously pessimistic psychiatric attitudes towards the aged mentally ill person. Gal[1] has pointed out that there is no exact correlation between the intensity of mental symptoms and the severity of the pathological findings. The actual pathology presents only one facet, and is not the major etiological factor in the mental disease of the aged. Individual vulnerability and the capacity to compensate for cerebral damage must be taken into consideration. It is indicated that unfavourable personal and social factors impair the individual's ability to withstand cerebral damage. Mental disorder often begins in consequence of retirement, joblessness and financial insecurity. Kral and Wigdor[8] reported their observations from a geriatric outpatient clinic. The important finding is confirmation that a great part of their patients were able, even at an advanced age, to compensate in the daily task of living for the organic deficit which was evidenced in their psychological test performances. Such testing revealed signs of marked organic cerebral impairment in three times as many patients as was evident on clinical examination.

The somatopsychological effects of illness in the aged person were studied by Kleemeier.[9] He also points out that ageing is associated with an increase in illness and disability. Disease, illness and disability are produced by those agents which disturb the homœostatic balance of the organism, whether these are infections, traumata, dietary disturbances or toxic substances. He then refers to Selye's state of stress and adaptation theories, to describe ageing as the product of the cumulative effects of wear and tear of stress situations and of the adaptations to them. From this point, he describes emotional distress as one condition which is also favourable to the development of disease and illness, and an important accelerator of the ageing process. He outlines the major psychological consequences of somatic illness as: (1) a reduction in scope of interest in the outside world, (2) increased egocentricity, (3) regressive behaviour, (4) greater internal behaviour determinants, (5) frustration, due to an inability to satisfy basic needs or to reach basic goals, which undergoes various changes to aggression, displaced hostility, and finally withdrawal, isolation and lack of adaptation learning.

The decrease of adaptation skills and behavioural abnormalities in the aged have always been viewed pessimistically by psychiatrists. Such changes were always attributed to degenerative brain and vascular lesions, thought to be irreversible and progressive in nature. However, more careful studies, particularly in the past 20 years, are leading to a newer and more optimistic orientation towards the mental disturbances of the aged. In the first instance, it is now recognized that affective disorders do occur in the aged as in the young, and their clear differentiation from the organic dementias will lead to more active and appropriate therapy. Ehrentheil,[10] in common with many others, points out that the pre-morbid personality plays an important role in the resistance even to organic brain changes. External factors, such as the death of someone close, the loss of a job, or bodily sickness, may suddenly diminish the will to fight disease, and this may bring to the fore the organic mental defect previously adequately compensated for. There is an interplay of the organic brain changes and the sociopsychological and personality factors.

Gunther Wolff[11] discusses geriatric mental patients at the Camarillo State Hospital in much the same vein and attributes their improved patient care and the recovery of previously lost patients to the new staff optimism, and to the more energetic use of psychotherapy, drugs, electroshock and physical care measures.

Kurt Wolff[12] echoes similar opinions. The greatest difficulty is to overcome and change the former attitude of hopelessness in treating the emotionally disabled geriatric patient, which may also be fostered by countertransference feelings towards parental figures. The change in therapeutic attitude towards greater optimism is the vital factor in replacing custodial care by an active therapy program.

Rudd,[13] in fact, correlates the need for such a new approach with the prevention of senile dementias. He quotes Gitelson, Rothschild and earlier workers to confirm and validate his impressions, that one must utilize a newer "biological" approach which more adequately describes present-day findings. With this approach, senile dementia is regarded as a stress disorder of a nature resembling a psychosomatic illness. In this "biological" view, illness can occur when the individual, predisposed to react in certain ways by his life experience, encounters a situation to which he cannot readily adapt. This, in fact, becomes a frequent starting point for senile dementia. Self-esteem crumbles, leading to panic, and the stage is then set for withdrawal from external reality. He suggests that efforts be made to retain the social integration of the aged, perhaps by the establishment of guidance clinics to increase understanding between the aged and the middle-aged group.

Warren[14] has emphasized similar factors in discussing the mental confusion of elderly persons—pointing out that medical indifference quickly converts a reversible state into an irreversible one.

Loss of special senses, the death of a spouse, social isolation, sudden retirement, or loss of activity can rapidly lead to depression and apathy with serious repercussions in both mental and physical health. This author calls for special efforts to maintain good health, and increased employment opportunities in the senescent period.

This brief survey of pertinent literature underlines the current gropings to delineate the multiple problems associated with ageing. New data are certainly required about the underlying physiological processes, as well as a fuller understanding of the effects of ageing on the person himself, on the family and the community, on established economic and cultural practices, and on matters which have a direct bearing on health and sickness in the aged.

A familiar phantasy, culturally and economically nurtured, is that the ideal old age requires only an adequate retirement income. With this as a basis for serenity, the person can then use all the free time to travel, to rest, to pursue hobbies, to fulfil wishes long deferred by the economic necessity to earn a living. However, the observed data, referred to above, indicate that in reality the facts are strikingly different from the dream of a golden age. The aged become socially and functionally incompetent within a rigid inflexible social and economic structure, and they are thus deprived of work and the attending social benefits of recognition, participation and self-esteem. Neurotic fears of isolation and abandonment are exacerbated, and often fulfilled, as the aged are pushed aside by the young and the vigorous. For many who fearfully approach old age, the only recourse is to deny reality and the passage of time, to utilize hair dyeing, face-lifting, rejuvenating procedures, and to regress to adolescent preoccupations in a flight from reality. The data also infer that society has no place of honour for the aged individual, so that retirement is not in fact a time for fulfilment, but rather becomes a lonely travail, a period of emptiness and deterioration, an impatient time interval before death, a flight into a second childhood. Thus social, economic, psychological and physical factors all participate to a varying extent in the effectiveness with which the aged individual can retain health and useful function within our community. The breakdown products, the maladaptations, the mental deterioration states fall more directly into the province of the physician for solution and for medical care.

The writer has had a considerable clinical experience in dealing with psychiatric problems of the ill aged, both in a general hospital setting and in the setting of a hospital for chronically ill aged persons. The Jewish Hospital of Hope (Montreal) is a hospital for the treatment of chronic diseases, and the population is largely of the senescent group. The illnesses represented are hemiplegias, degenerative cardiovascular diseases, parkinsonism, terminal cancer, chronic neurological diseases and others. Many of these patients have, in addition, a degree of cerebral degeneration, due either to the primary disease process which has led to the hospital admission, or to the age of the patient, or to a combination of both. Persons with primary senile dementias are not admitted, as the community resources include other facilities for such treatment. However, it is difficult indeed to draw a clear line between the mentally disturbed state and the physical disorder, and many of our patients present mixed states, including toxic delirium, metastatic brain lesions, and affective disorders secondary to the disabled state. Affective disorders manifest themselves quickly in this type of patient by the rapid development of an organic reaction pattern, with confusion, disorientation, memory impairment, loss of reality contact and loss of object identification, coupled with anxiety, panic, agitation and resistance to nursing and other management. Special routines pertinent to the hospital admission policy allow one to make useful observations on this matter. It is our inflexible regulation that all patients, before admission, must be examined either at home or wherever they happen to be, by one of the staff physicians of the Hospital of Hope. Special attention is given during this preliminary examination to establishing the mental status, as well as to outlining the primary illness state. In this way, the obvious senile dementias and other psychotic states of the aged are screened out. However, it has been observed over a period of many years that when selected "suitable" patients are admitted to this hospital, a very high proportion are found to be in a confused, disoriented and psychotic state. After a relatively short period, and within two or three weeks of admission, many of these mentally disordered states clear to an appreciable extent, and the patient, still chronically ill and aged, makes a satisfactory adjustment and becomes a participating member of the hospital community. These findings cannot be explained by previous neglect or exacerbations of the illness, but are more obviously related to the environmental dislocation for the patient who is unable to make adaptations readily. The move from home to a new and unfamiliar hospital setting, the loss of contact with familiar persons and accustomed routines, leads to panic, withdrawal and confusion in many elderly patients who are operating at a borderline level and are barely able to deal with reality at a simple level. Such patients do not have the reserves and resources needed to make new adjustments rapidly. The onset of organic confusional states has also been observed in our resident patients, as they become readily disorganized by a febrile illness, by a minor operative procedure, or by transfer to another hospital for special therapies. Observation reveals also that similar states are precipitated by intra-hospital happenings such as the failure of expected relatives to visit, a quarrel with another patient, or an unexpected change in nurse or

physician. The ease and readiness to manifest psychotic states in this population is rather striking, as is the frequent and gratifying response to treatment. Reversible psychotic states in the aged have perhaps been missed in the past, and as a reflection of therapeutic pessimism, allowed to develop into the irreversible disorder. Observational data confirm that while chronic illness may exist over a period of years, the mental breakdown of the patient is related to psychological and sociological traumata. Retirement from work, cessation of usual activities, involutional contractions of self-esteem, loss of normal object contacts and separation reactions precipitated by the death of an important family member or removal from the home or a familiar environment are all factors of importance in taxing the resourcefulness of all the aged members of our society. The presence of a chronic illness means the addition of the burden of pain, disablement, dependency on others, incontinence, loss of power, strength and control, and financial insecurity. The frequent result of such insults is a profound loss of prestige and self-esteem which produces marked anxiety and a withdrawal from normal object relations. The "giving up" and loss of normal interests is essentially the reflection of a depressed state. The aged person is especially vulnerable to the effects and the sequelæ of a depression—not only because nutritional deficiencies so readily appear, but because advancing age is also accompanied by an enfeebled grasp on reality and an increased egocentricity and the reliance on internal memories and phantasies which are less and less subject to reality judgments. In such patients, there is actually a marked condensation of the interval between the affective functional disorder and the organic psychotic state. The author feels that many organic confusional states of the aged are in fact depressive equivalents. Here is evidenced a true indivisibility of the psychological and the somatophysical, the functional and the organic. The awareness of this close association between depressive reactions and some of the mental deterioration states has obvious and practical clinical applications.

Illustrative Cases

Case 1.—G.S., a married woman of 76 with a history of arteriosclerotic heart disease, a large renal stone, a ventral hernia developed subsequent to a subtotal gastrectomy and successful removal of a parathyroid tumour one year earlier. While on a trip she developed a depressed reaction. On examination at home, she showed a typical depressed reaction, with intermittent agitation and retardation, insomnia, loss of appetite, disinterest and inability to carry on her usual activities, impaired contact with reality, and somatic distress of the bowel. On her admission to hospital within a few days, she presented a typical picture of an organic brain syndrome, with confusion, disorientation, impaired memory and misidentifications. The examining resident made a diagnosis of cerebral arteriosclerosis. A course of electroshock, along with other supportive measures including supportive psychotherapy, sedation, vitamin therapy and androgens, resulted in a rapid recovery to the pre-morbid state, and she returned home.

Case 2.—R.B., a married woman of 74 with a history of large bowel resection two years previous for a carcinoma and a functioning colostomy. The patient had a typical obsessive-compulsive personality structure and was unable to adjust to the loss of bowel control nor was she able to accept the colostomy. Though discharged as surgically well, the patient became more and more depressed and agitated; she was fearful, unable to be alone, and rapidly losing weight and strength to 88 lb. The thought content showed preoccupation with death, desertion, mutilation phantasies. The patient was first admitted to a psychiatric service selected by the family and was under the care of a resident who had counter-transference problems to maternal figures. She was given tranquillizers and was not actively involved in therapy of any sort. She was discharged home in much the same state as on admission. She was soon readmitted to another psychiatric service under the writer's care, and was by then showing many signs of gross organic cerebral decompensation, with confusion, disorientation and misidentifications. However, in a six weeks' hospital stay which included subcoma insulin, electroshock and other ancillary measures, she made an excellent recovery and returned home to take up her usual functions.

Case 3.—R.L., a 65-year-old married woman admitted to the Hospital of Hope in June 1958. Diabetes for seven years, hypertension with cardiac enlargement and more recent parkinsonism of marked degree, so that she was unable to walk unaided. Emotional disturbance was noted on admission, with a history of thyrotoxicosis 15 years previously. Soon after admission she was very apprehensive, confused and disoriented, and expressed persecutory delusions and depressive wishes for death, projected to the environment, i.e., the doctors and nurses wanted her to die. She was unco-operative to nursing, and screamed in an agitated manner when approached. She was started on imipramine (Tofranil) January 7, 1959, after various other drugs, sedatives, stimulants and tranquillizers had failed to change the clinical state. Within two weeks, the delusional ideas were gone, nightmares ceased, the depression lifted to a marked extent and the patient became pleasant, co-operative to care, and began pursuing physiotherapy and other hospital activities with interest. The dose of imipramine was 75 mg. daily and she is being maintained on a 50 mg. daily level. The improvement in clinical state has been remarkable.

Discussion

The three cases briefly outlined are representative of successful results in patients who have responded to appropriate treatment measures, even in a group of patients who are aged and otherwise chronically ill. These patients all had prominent signs of organic cerebral deficit, in addition to an underlying depressive reaction. Energetic treatment of the masked depression resulted in clinical

recovery from the psychotic regression, including the organic confusional state. In the individual histories of these patients, the factors precipitating the psychotic reaction were separation from home, the disruption of lifelong obsessional controls which had previously served to encompass overwhelming anxieties, and in the last case, the progressive and increasing burden of physical illness leading eventually to a helpless, frozen, rigid state of incapacity. In the life of other patients whose case histories are not documented here, the recurring themes precipitating the physical and mental breakdown are job retirement, the death of a needed person, abandonment, the social and family break-up incidental to divorce, economic pressures and physical incapacity. The critical life situation is one of situational stress to which the person with reduced capacities cannot adapt. This results in regression and the appearance of pathological adaptations which are clinically recognized by the appearance of the signs and symptoms which confront the physician for diagnosis and treatment.

The application of electroshock in such cases is by no means new, as it has previously been reported that such treatment, when appropriate, may be given even in the presence of physical contraindications,[15] which are after all only relative. A number of writers have also reported on the successful use of electroshock in the organic psychoses.[16] Undoubtedly, in the latter group, there has been a proportion of such cases as are described above, namely, organic brain syndromes with which is associated a large depressive element. Not all depressive reactions in the aged chronically ill respond as satisfactorily. It is well known that when contamination by other elements exists to complicate the depressive reaction, the therapeutic response is less satisfactory. Such contaminations are often present in the aged chronically ill group. These patients reach hospital only after many therapeutic measures have failed, and when the family resources, both financial and emotional, have been exhausted. Once the patient is put in an institution, there is too often the general feeling of resignation, that "this is the end of the trail". It is often a fact that the hospital patient must face the reality that there is nothing to get well for, and nothing to return to. The family group readily reorganizes to exclude the aged sick relative in an institution.

Another factor pernicious to recovery has its roots in the institutional organization itself. The "good" patient is the one who is passive, docile, submissive and dependent. This kind of adjustment is rewarded by the hospital staff in many ways. The troublesome patient, on the other hand, the patient who is struggling to maintain his identity, to retain his independence and to assert his individuality is regarded as a nuisance and a problem, and subtle or more direct hostility is expressed to make him conform. These aspects of hospital care provide secondary gains to encourage the acceptance in the patient of the regression he may be struggling against. There exists in our patients a combination of old age, chronic illness, rejection by the family and society, loneliness, a loss of self-esteem, minimal motivation to get well, and the implied encouragement towards regressive behaviour in the institutional setting. These factors combine to provide a formidable obstacle to successful therapy in many patients, and one must sometimes accept the more limited goals of symptomatic treatment, the relief of suffering, the comforting word to the lonely and the lost. It is likely that new drugs and new treatment techniques will evolve and a number of those who are now lost will be salvaged. However, the prevention of this typical syndrome is as much to be aimed for as its cure.

In our society particularly, the reward is to the young. Work helps the individual achieve many things—self-respect, independence, the capacity to be useful to others, identification with the group and attainment of new prestige values.[17] Many persons rely on work almost exclusively to give meaning to their life, and after retirement they do not have the resources and the elasticity to derive gratification from hobbies, golden age clubs and the like. It is this writer's opinion that medicine must take the lead in pointing out to the community at large the urgent need to provide a work program for those of post-retirement age. This would be an expression of preventive medicine operating in the socio-economic sphere of life. This is not a plea for the extension of sheltered workshops or occupational therapy. I have in mind rather the need to provide for the continuance of work, but work necessarily modified to a part-time basis and under conditions free from the competitive strains of the assembly line. A project to cover many fields of work activity would undoubtedly be costly to establish and maintain, but the final cost to the community would be lessened by the reduced drain on welfare agencies and by the postponement of those disabling illnesses which otherwise rapidly develop out of boredom, retirement idleness and the depression of the empty meaningless life which expresses in so many oldsters the desire to die, rather than the wish to live. Apart from the financial aspects and the postponement of illness, the dignity of man itself is a precious heritage to be preserved. This problem has become to medicine a matter of primary concern. From the medical ranks must come the guidance and advice as to the new directions to be taken in meeting and resolving these problems of our ageing population. Such advice can be soundly based on the principles of preventive medicine, and if persistently re-stated, will awaken a response in mobilizing such community resources as are necessary to provide the teamwork called for in activating an effective program. The basic issue to be re-stated is the need for the reinclusion rather than the exclusion of the aged in our population.

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RÉSUMÉ

L'auteur passe en revue les différentes théories qui cherchent à expliquer le processus de sénescence. Certains y voient un changement biochimique qui prendrait origine dans le système nerveux central; d'autres y voient la réflexion du déclin de certaines fonctions, comme par exemple, la capacité de travail. D'autres encore croient que la principale lésion psycho-sociale de la vieillesse est l'ennui qu'entraîne le désœuvrement. Le résultat du traumatisme narcissistique que produit la vieillesse serait une perte d'amour propre dans le domaine fonctionnel organique. Certains sujets savent combler leur déficit cérébral organique dans leur vie quotidienne à un degré étonnant. La personnalité du malade telle qu'on la connaissait avant que la maladie ne manifeste ses symptômes joue un rôle important dans la résistance même aux troubles organiques cérébraux. Dans plusieurs cas la démence sénile débute à l'occasion d'une situation à laquelle le vieillard ne peut s'adapter car il n'a été préparé à réagir que d'une certaine manière par son expérience de la vie. La panique qui s'ensuit mène à la perte de contact des réalités extérieures.

Le mythe doré de la retraite avec pension et liberté de se livrer à ses passe-temps favoris, voyages et autres, toujours remis à plus tard par la nécessité de gagner sa vie, se dissipe à la lueur des faits: les gens âgés deviennent socialement et fonctionnellement incompétents à l'intérieur d'un cadre socio-économique rigide et inflexible. Les craintes névrotiques de l'isolement et de l'abandon prennent libre cours et sont malheureusement quelquefois justifiées. Il n'est pas toujours facile de différencier un état de désordre mental d'un état de désordre physique car plusieurs malades à cet âge présentent des états mixtes. Malgré un examen clinique à domicile par un membre du personnel de l'hôpital afin de dépister toute démence sénile ou autre psychose de la vieillesse, plusieurs malades admis dans les institutions pour vieillards manifestent un déséquilibre émotif au moindre contretemps. La restriction du champ d'intérêt peut pousser l'indifférence ou le renoncement jusqu'à la dépression. Trois cas sont cités en exemple.

PINE HOUSE (SASKATCHEWAN) NUTRITION PROJECT*

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THE HEALTH of the community, particularly of its less favoured members, is the concern of society as a whole. A valuable index of the standard of health in any one place is the infant mortality rate. Though in 1957 this was down to 25.5 per 1000 live births for the province of Saskatchewan as a whole, it was still very high, namely 75.9 per 1000 live births, in the Northern Administrative District; this high infant death rate is almost the same as that in Saskatchewan as a whole 30 years ago. In an endeavour to improve the standard of living, the Division of Child Health was asked to provide funds to supplement what is often a starvation diet; hoping to stimulate local action, we decided to set up a demonstration nutrition project and to precede this with a survey of the nutritional status of a group of children in an isolated community in the northern part of the province. This preliminary survey was confined to Pine House and Pelican Narrows.

Pine House is a small isolated community of 200 people living on the edge of Pine Lake some 40 miles west and 10 miles north of La Ronge. The population is largely Metis and often the sole source of income is family allowance cheques. The inhabitants live mainly by trapping and fishing and they subsist for the most part on bannock and fish, supplemented by lard, a little milk and fresh meat, mainly moose and muskrat. The only medical aid is provided by a public health nurse and her only means of transport is by air; the nearest general hospital is 200 miles away.

This community was visited early in February because it was felt that their nutritional status would be at a low ebb at this time and because access by plane before the spring thaw was easy. Pelican Narrows is a community of nearly 600 people made up largely of Treaty Indians; it is situated 100 miles east of La Ronge and, unlike Pine House, the settlement has a modern Indian Health Services hospital and a full-time staff nurse in attendance. The diet of these children was similar basically to that enjoyed by the children at Pine House but it contained rather more milk, porridge, fruit, fish and bread.

MATERIAL AND METHODS

Two groups of children were studied. The first group consisted of all the children attending school at Pine House; there were 28 girls and 16 boys, aged 6 to 15 years. The second group was an unselected number of pre-schoolchildren at Pelican Narrows, consisting of 16 girls and 16 boys, aged 2 months to 5 years. These children were first weighed, the children under 5 being naked while the boys over 5 wore "jeans", and then measured in bare feet. The children were examined carefully, after which the hæmoglobin value was estimated using a Spencer hæmoglobinometer, and blood was

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taken for estimation of vitamin C, carotene, vitamin A and total protein. This blood was centrifuged at once and the serum withdrawn, frozen and shipped for analysis to the laboratory of the Nutrition Division of the Department of National Health and Welfare.

The heights and weights of the schoolchildren were compared with those of normal schoolchildren in Saskatoon, the latter figures being provided by the school medical officer. The heights and weights of the pre-schoolchildren were compared with Engelbach's tables;[1] the latter, we have found from experience, are applicable to young children, though their figures are below the average for children aged 10 years or more.

The hæmoglobin, vitamin A and C, carotene, and serum protein levels were compared with those found in a group of 14 children in Regina, the blood being collected from the latter children under comparable circumstances.

RESULTS

Height and weights.—The heights of the 15 boys and 28 girls at Pine House and of the 15 boys and 16 girls at Pelican Narrows are expressed as a percentage of those expected for age and the weights as a percentage of those expected for height (see Table I).

TABLE I.

	Pine House		*Pelican Narrows*	
	Heights	*Weights*	*Heights*	*Weights*
Boys.....	98%	100%	96%	103%
Girls.....	97%	92%	100%	105%

Hæmoglobin.—The mean hæmoglobin level of the boys and girls under 6 years of age (Pelican Narrows) was 10.7 g. per 100 ml., with a range of 7.5 g. - 12.5 g.; the mean level was the same in the boys and in the girls. The mean hæmoglobin level of the boys at Pine House (age 6-15 years) was 13.5 g. (11.2-15.5 g.) and of the girls (6-15 years) was 13.6 g. (10.5-14.8 g.); the mean hæmoglobin level of the normal children in Regina (age 7-18 years) was 13.5 g. (12.5-14.8 g.). The hæmoglobin levels were lower in the younger children at Pelican Narrows than in the older children at Pine House; the lowest levels (7.5-9.5 g.) were found in the children between 11 and 24 months of age, in whom the anæmia was nutritional in origin.

Serum vitamin levels.—These studies (Table II) were undertaken in February at Pine House, in July at Pelican Narrows, and in May at Regina; they are not therefore strictly comparable. The serum vitamin A, carotene and ascorbic acid levels taken in February at Pine House were, on average, much below the accepted normal levels and were also much below the levels found in normal children in Regina. The comparable figures obtained at Pelican Narrows in July revealed on average low vitamin A levels and normal levels of carotene and ascorbic acid, though both the latter were below the levels found in normal children in Regina. The serum protein levels in the children at Pine House were in the normal range, the levels in the younger children at Pelican Narrows were appreciably lower, and in no instance was the total serum protein above 7.0 g. per 100 ml.; there was no concomitant nutritional œdema. Serum cholesterol levels were estimated in 6 boys and 9 girls; the mean level was 181 mg. % (115-235 mg. %), and there was no significant sex difference.

Dental status.—As would be anticipated, dental caries was less evident among the pre-school-children, only 7 of the 27 children with teeth having extensive caries; it was more evident among the schoolchildren and was present in 16 of 28 girls (in 8, more than three teeth were carious), and in 13 of the 16 boys (in 6, more than three teeth were carious). Dental fillings were conspicuous by their absence, for none of the children had received the benefits of modern dental care.

Infections.—Infections were extremely common in the schoolchildren at Pine House. Fourteen girls and 8 boys, half the children, had an appreciable cervical adenitis, due probably to recurrent throat infections; 16 girls and 4 boys were heavily infested with pediculosis capitis; 14 girls and 8 boys had scabies and in the majority there was scabies and associated secondary impetiginous infection; 4 girls had skin sepsis without scabies; 4 children had frank otorrhœa with active middle ear disease. The 32 pre-schoolchildren at Pelican Narrows were, by contrast, surprisingly free from infections; none was infested with pediculosis capitis, none had scabies, only one child had an otorrhœa, seven had an appreciable cervical adenitis, six had mild skin sepsis (impetigo), and five others had evidence of past skin sepsis.

DISCUSSION

As has already been stated, this survey was undertaken as a prelude to a demonstration nutrition project at Pine House. This project has now been started. The Pine House children, while at school, are now receiving a mid-day meal containing milk soup, vitamin D, vitaminized biscuits, orange or grapefruit juice, hot chocolate, prunes and raisins.

With regard to the general physical status of the children examined, they were not obviously undernourished, and though the boys and girls of school age were a little shorter than average for age, the girls alone were under expected weight for height. No frank deficiency diseases were encountered but the serum vitamin A and carotene levels were low, as were the vitamin C levels in those children examined in March. There was no evidence of anæmia or hypoproteinæmia in the schoolchildren but nutritional anæmia and hypo-

TABLE II.—SERUM VITAMIN A, CAROTENE, ASCORBIC ACID, PROTEIN AND CHOLESTEROL LEVELS

	Pine House (Feb.)		*Pelican Narrows (July)*		*Regina (May)*	
	Boys (15)	*Girls (27)*	*Boys (6)*	*Girls (8)*	*Boys and girls (13)*	*Normal range*
Vitamin A μg./100 ml.	14 (6-32)	14 (9-25)	14 (8-22)	16 (10-38)	28	20-100
Carotene μg./100 ml.	32 (19-66)	34 (19-43)	53 (41-62)	45 (38-53)	121	40-100
Ascorbic acid mg./100 ml.	0.44 (0.18-1.45)	0.53 (0.11-1.43)	0.92 (0.36-1.71)	0.81 (0.36-1.8)	1.61	0.4-1.5
Proteins g./100 ml.	7.4 (6.7-8.0)	7.3 (6.7-8.1)	6.7 (6.3-6.9)	5.9 (4.5-6.9)	Not done	6.0-8.0
Cholesterol mg./100 ml.			177 (115-230)	183 (115-235)		150-250

NOTE:—Serum vitamin A, carotene, ascorbic acid, protein and cholesterol levels in children at Pine House (age 6 - 16 years), at Pelican Narrows (age 2 to 5 years) and at Regina (7 - 13 years). The studies were undertaken in February at Pine House, in May at Regina and in July at Pelican Narrows.
Figures show average values and range (in parentheses).

proteinæmia were commonly present in the pre-schoolchildren tested. That the nutritional status of the children should not have been worse is perhaps surprising, considering the limited nature of their basic diet.[2]

At Pine House our main abnormal findings were related not to nutrition but to infection. Half the children had scabies; in the majority there was an associated secondary impetiginous infection, and nearly half the children were heavily infested with pediculosis capitis. Cervical adenitis was also frequent and no doubt due to chronic or recurrent tonsillar infections; four children had active middle ear disease, and dental caries was common.

The infections which these children had were due in part to lack of facilities for washing and bathing and in part to their isolation from medical and dental care. Water, of course, is freely available at Pine House but in winter it is used sparingly, because it is all drawn from the lake through holes in the ice. It is not surprising that scabies and pediculosis are common; it is surprising that they are not universal. There are many families who, in spite of the obstacles to good hygiene, remain free from infestation. The high incidence of cervical adenitis and the attendant throat and ear infections indicates that these children must have frequent, untreated upper respiratory tract infections and that they would benefit by greater availability of professional care. The frequency with which dental caries was encountered also highlights their need for dental attention.

There has been no resident public health nurse in the Pine House area since 1948. At Pelican Narrows, where there is a resident nurse, the incidence of minor infections and infestations is minimal. We feel that the establishment of a combined Indian Health Services and Provincial Health Department hospital at La Ronge with a doctor in charge, coupled with more frequent visits to Pine House by one of the two provincial health nurses, will improve the standard of health at Pine House, but to obtain an appreciable improvement in the standard of living the persistent and wholehearted interest and support of the community in general and of the provincial government in particular will be required.

SUMMARY

An examination of 44 schoolchildren at Pine House and of 31 pre-schoolchildren at Pelican Narrows in the Northern Saskatchewan Administrative Area revealed no manifest deficiency disease, but the vitamin A and C levels in the serum were below the recognized normal levels in many instances and hypoproteinæmia and anæmia were also common in the younger children. Scabies, usually secondarily infected, pediculosis and throat infections were extremely common at Pine House. In order to ensure better health a higher standard of hygiene as well as of nutrition is required. The children also need more medical and dental care than is available at present.

We are very grateful to Dr. Aden Irwin who assisted this survey, to Miss D. Andrews, Miss M. Black and Miss M. Crawley for their help and to Dr. L. B. Pett for the biochemical estimations. We are also grateful to the Department of National Health and Welfare for a Child and Maternal Health Grant to cover this nutrition project.

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RÉSUMÉ

L'examen de 44 enfants d'âge scolaire à Pine House et de 31 enfants d'âge préscolaire à Pelican Narrows, localités situées dans le territoire administratif du nord de la Saskatchewan, n'a montré l'existence d'aucun syndrome polycarentiel. On a noté cependant que les taux de vitamines A et C du sérum dans plusieurs cas n'atteignaient pas le niveau que l'on accepte comme normal, et que l'hypoprotéinémie et l'anémie se retrouvaient souvent chez les jeunes enfants. La gale, habituellement compliquée d'infection secondaire, la pédiculose et les angines sont très fréquentes à Pine House. L'amélioration de la santé dans ces milieux dépend d'un meilleur niveau d'hygiène et d'alimentation. Ces enfants ont aussi besoin de soins médicaux et dentaires plus abondants que ceux qu'ils reçoivent actuellement.

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Case Reports

PLEURAL MESOTHELIOMA* CASE REPORT AND SOME DIAGNOSTIC FEATURES

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MESOTHELIOMA is a rare tumour of the serosal lining of the body cavities. The existence of this tumour has been questioned by some authorities[1-3] who consider the growths to represent secondary deposits of an undiscovered primary tumour elsewhere in the body. Among those[4-6] who do recognize mesothelioma as a separate entity, there is general agreement that there are two different types, the solitary and the diffuse.

We wish to report a case of a pleural mesothelioma of the diffuse type which came recently to our attention‡ and to discuss a few diagnostic points of value which have been gathered from the literature.

CLINICAL SUMMARY

A 52-year-old white woman was admitted to the Kingston General Hospital on July 31, 1957, with complaints of shortness of breath and cough of four months' duration. The cough was unproductive. As well, she had aching pain in the right lateral chest wall of four weeks' duration. Six weeks before this admission, she was admitted to another hospital, where a right pleural effusion was found. The effusion was aspirated three times, relieving the patient's symptoms only for a short time. Some unknown weight loss was noticed shortly after the onset of the above-mentioned symptoms. The history of previous illnesses was essentially negative, except for repeated attacks of "sore throat", a few of which preceded the present illness.

On admission here, the positive physical signs were confined to the non-expansive right chest. There was dullness to percussion, absence of breath sounds, and diminished vocal resonance over a large area in the mid-scapular line posteriorly. Neither rales nor rhonchi were heard. The blood pressure was 120/85 mm. Hg and pulse rate was 80/min., but the respiration rate was 33/min. The temperature was 98.8° F. On percussion the apex of the heart was found displaced to the left. A squeaky, short, high-pitched sound was audible at the apex. It was louder on expiration, but was unrelated to the respiratory phases and was unaltered by position. No heart murmurs were heard. The laboratory data were essentially normal except for a sedimentation rate of 30 mm./hr.

Roentgenologically, there was a pneumothorax on the right side with approximately 50% collapse and fluid accumulation at the right base with a level reaching up to the 9th interspace posteriorly. The heart was reported to be displaced a little to the left.

The clinical impression at this time was: (1) right pleural effusion due to either infection or malignancy, and (2) pericarditis.

There was considerable difficulty in establishing a definite diagnosis. The numerous radiographs taken were non-contributory except for one dated August 6, which was read as ". . . . projected through the pneumothorax in the right upper lung field are several various-sized areas of increased density. It is felt that these are due, in all probability, to localized tags projecting from the parietal pleura in association with the pleural effusion, but it would not be possible to exclude the diagnosis of tumour deposits."

A thorough search through the various systems of the body failed to reveal a primary malignancy.

Although early during the patient's stay in hospital the first consulting surgeon included mesothelioma in the differential diagnosis, no further comment pertinent to this suggestion was found on the chart. Frequent withdrawals of quantities of fluid up to 2500 c.c. at a time from the right pleural space gave the patient considerable relief from the shortness of breath and pain, but the fluid re-accumulated very rapidly, necessitating the institution of continuous suction. The pleural fluid, examined on three occasions, as well as bronchial washings, was reported to be negative for the presence of malignant cells. In retrospect, however, the following report on a specimen of aspirated pleural fluid deserves mention: "The specimen contains a few small clumps of moderately sized large cells which have nuclei of variable sizes. These have fine nuclear membranes and prominent nucleoli. Some are folded or indented. The chromatin is finely granular and often dispersed through the nuclear membrane. The amount of cytoplasm is variable, and vacuoles are often noted in it. It is darkly eosinophilic to slightly basophilic. No mitoses are found and these cells appear to be hyperplastic serosal cells and histiocytes."

A bronchoscopy performed on August 16 furnished no evidence of intrabronchial tumour and no abnormal secretions were noted. Two weeks later a thoracotomy was performed. The right pleural cavity contained nearly one litre of fluid. The numerous adhesions found between the visceral and parietal pleura were easily separated. On the right parietal pleura, numerous small, greyish-white, rather firm nodules and near the apex a mass of hard, greyish-white tissue were found. The largest deposit measured about 3.5 cm. in diameter. The lung was examined and no masses could be felt. Several portions of tissue were removed for biopsy.

Gross and Microscopical Examination

Gross examination: The removed tissue was nodular but had a highly irregular surface. It was firm and yellowish-white with a slight tinge of red, and the cut surface had a whorled pattern.

Microscopical examination: While the microscopic picture varied from area to area, the tissue consisted of two distinct components. These were a fibrous and an epithelial component, intimately associated with each other. The variation in the picture of the tumour

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‡We should like to thank Dr. Bingham, Professor of Surgery at Queen's University, for his kind permission to publish this case.

Fig. 1

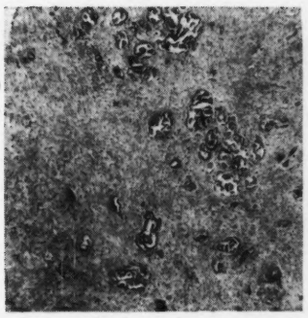
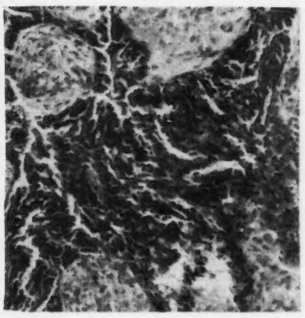


Fig. 2



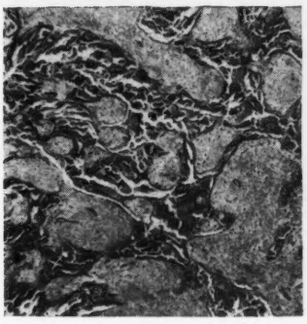


Fig. 3

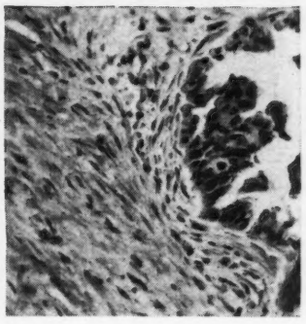


Fig. 4

Fig. 5

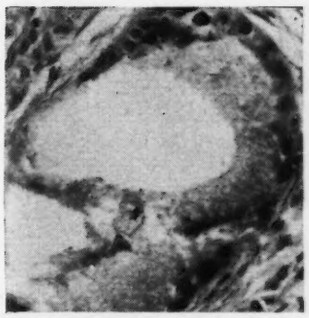
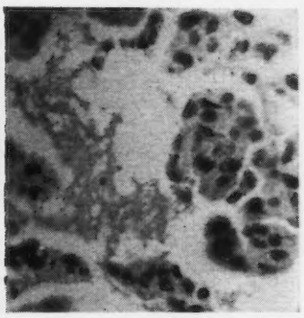


Fig. 6



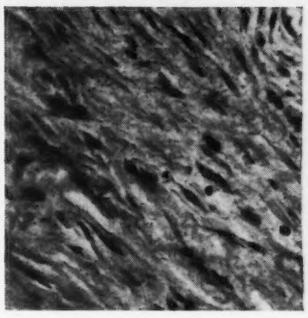


Fig. 7

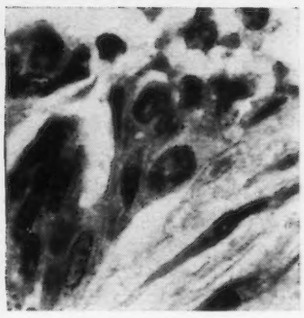


Fig. 8

Fig. 1.—An area with a predominantly fibrous connective tissue component. Epithelial cells (mesothelium) are lining gland-like spaces. Hæmalum-phloxine-saffron; × 27.

Fig. 2.—An area with abundant epithelial cells. The connective tissue is seen in the form of whorls and cords as the supporting stroma (upper half) or loosely arranged between the epithelial cells (lower half). Hæmalum-phloxine-saffron; × 102.

Fig. 3.—An almost equal distribution between the fibrous and epithelial components. The fibrous whorls are covered by epithelial cells; the latter are also arranged in sheets and cords. Hæmalum-phloxine-saffron; × 27.

Fig. 4.—Gland-like spaces lined by epithelial cells. These are present in some areas in a single layer, in others in a piled-up fashion. Hæmalum-phloxine-saffron; × 244.

Fig. 5.—"Glands" secreting fluid which gave a positive staining reaction for the presence of acid mucopolysaccharides (dark grey in photograph, blue in section). Alcian blue—PAS—Hæmatoxylin—orange G; × 368.

Fig. 6.—The secretion did not stain for mucin (light grey in photograph, light grey in section). Best's mucicarmine—Lillie's hæmalum—metanil yellow; × 410.

Fig. 7.—In this area all connective tissue components are mature, and almost uniform. They appear normal. Hæmalum-phloxine-saffron; × 368.

Fig. 8.—The upper half is occupied by epithelial elements, the lower (right) by both connective tissue fibres and cells. The latter have clumped, dense, bizarre nuclei and assume atypical forms. The epithelial cells grow either in clumps (upper half) or membranous sheets (lower left). They are either polygonal or elongated in shape. An atypical mitotic figure is seen at the extreme upper right. Hæmalum-phloxine-saffron; × 973.

was due to the fact that these two components were participating in tumour formation in various proportions to each other in different areas. In some areas the fibrous tissue was more abundant and the epithelial cells were present in a few small collections only (Fig. 1). In others the connective tissue was reduced so that it had the appearance of supporting stroma (Fig. 2). In still other areas there was almost an equal distribution between the fibrous and epithelial components. In such areas the fibrous tissue was arranged in whorls (Fig. 3). These were surrounded by epithelial cells and the connective tissue appeared to grow loosely between the epithelial cells (Fig. 2). Often these connective tissue fibres gave a definite impression of being closely applied to the epithelial cells.

At times the reverse of the process demonstrated in Fig. 3 could be noted; that is, the connective tissue was surrounding spaces which were outlined by the epithelial cells, rendering the impression of glandular spaces (Figs. 1 and 4). The lining cells were in a single layer in some areas, but were piled up in others (Fig. 4). The cells secreted a fluid either into the gland-like spaces (Fig. 5) or about them, when arranged in cords and large clumps (Fig. 6). This secretion stained a slight greyish-pink with our routine stain (hæmalum-phloxine-saffron). It gave negative results when stained for the presence of mucin (Fig. 6), but gave a strongly positive reaction when stained for acid mucopolysaccharides (Fig. 5).

The connective tissue component varied in its arrangement from parallel to whorled to haphazard. It also varied with regard to the stage of maturation of both the formed extracellular elements and fibroblasts. While in some areas both fibres and cellular elements were orderly and mature and had a normal appearance (Fig. 7), this was not true of other areas. Here the dense nuclear mass of the fibroblasts assumed bizarre forms (Fig. 8). The collagen was in a different stage of maturation, at times wavy but extremely thick, dense, and almost hyalinized single strands. Some of the latter were broken off (Fig. 9).

The epithelial cells varied, too, not only in arrangement but also in appearance. They could be seen in small clumps (Fig. 1); in cords and sheets (Figs. 2, 3 and 6) covering the fibrous cores; in whorls (Figs. 2 and 3); in single or piled up layers; and finally, in the lining of lumina which appeared to be preformed (Figs. 1, 4 and 5). At times they actually appeared to form lumina (Fig. 10). Their form and staining qualities varied. When they lined lumina in a piled up manner, and when they grew in larger aggregations, they had the appearance of a membranous growth. These cells were elongated and their nuclei were usually oval to elongated (Fig. 8). When they formed gland-like spaces and in some instances where they lined large lumina, they were round to oval (Fig. 10). The cytoplasm of these epithelial cells was moderately

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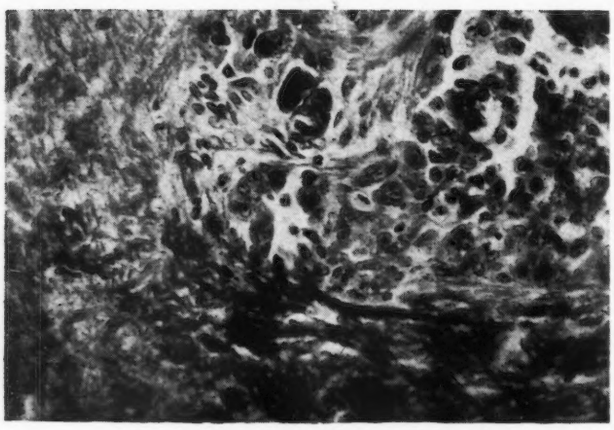
Fig. 9



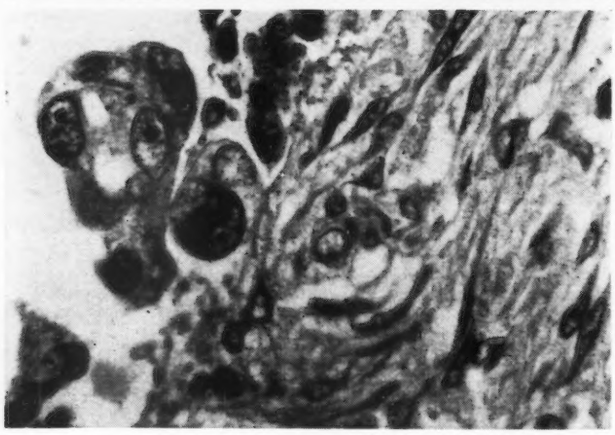


Fig. 10

Fig. 9.—Some of the collagen fibres are unusually thick, dense and fragmented (lower half). Masson's trichrome; × 244.

Fig. 10.—Gland-like formation by epithelial cells (left). These have moderately abundant cytoplasm. The nuclear membrane is distinct, the nucleolus prominent and the chromatin distribution dust-like. Pentachrome II; × 720.

abundant, and varied in staining qualities from slightly eosinophilic to basophilic. The nucleus always had a distinct nuclear membrane, a prominent nucleolus and a dust-like distribution of the chromatin (Fig. 10). Mitotic figures were seen only occasionally (Fig. 8).

Our diagnosis of a diffuse mesothelioma was based on the gross appearance of the tumour in combination with the microscopic picture. The presence of the epithelial and fibrous connective tissue components; their intimate relationship with one another; the attempt at gland-like formation; the presence of secretion which stained for acid mucopolysaccharides, but which did not give a positive result when stained for mucin were all characteristic of a mesothelioma.

The patient died outside the hospital in January 1958, one year from the onset of symptoms. Unfortunately an autopsy was not performed.

DISCUSSION

Mesothelium is the persisting cœlomic epithelium[7] lining such special serous cavities of the body as the peritoneal, pericardial and pleural. There is a tendency for the underlying mesoderm to form fibrous and vascular connective tissue rather than muscular tissue.[8] Mesotheliomas, the tumours derived from the lining of serous cavities, show a similar tendency. Thus elements of fibrous connective tissue proliferate and participate in the formation of the tumour in addition to the mesothelial cells. Since the mesothelium has the same origin as the epithelium of the genito-urinary tract, it is understandable that it has the potentiality to form gland-like structures, similar to kidney tubules and endometrial glands.

This dual histological picture of the mesotheliomas (*i.e.*, the participation of both epithelial and fibrous components in tumour formation) has contributed greatly to the confusion and controversy on the subject.

The two types of pleural mesotheliomas are the solitary, well-circumscribed tumour and the diffuse, nodular tumour, which usually is spread over the whole parietal pleural surface. Initial investigators referred only to the diffuse form, a tumour derived from the lining of the serous cavity. It was recognized as a pathological entity, but misdiagnosed as a lymphadenoma as early as 1890.[9] The solitary tumour of the pleura was described by Klemperer and Rabin.[6] They thought that this type of pleural neoplasm was derived from the tissues beneath the superficial lining rather than from the mesothelium itself. Stout *et al.*,[4, 10] however, leaning on tissue culture studies of explanted mesothelium, maintained that the solitary type has the same origin as the diffuse type of mesothelioma, namely from mesothelium. The solitary variety of the pleural mesothelioma has since been a well-accepted entity and numerous cases have been published in the world literature.[4, 11-16]

The histological picture of both types was repeatedly reported as being fundamentally different. Thus while the diffuse mesothelioma was thought to be characteristically composed of an epithelial component and fibrous connective tissue intimately associated with one another, the solitary form had been reported to be made up of connective tissue only.[6] This distinction no longer holds true. Recent cases of localized mesotheliomas were reported[11, 12, 15] which microscopically had all the features thought to be characteristic of the diffuse type. On the other hand a diffuse type was reported[17, 18] to consist of only one component, namely the connective tissue.

It is not in the scope of this article to discuss the various aspects of pleural mesotheliomas. These will be reviewed in a subsequent publication.[19] However, the clinical diagnosis seems important enough to warrant a discussion at this time.

Despite the fact that a clinical diagnosis of a diffuse pleural mesothelioma is rarely made, it is apparent from the literature that the clinical picture is a distinctive one. Thus unnecessary investigation and superfluous therapy could be avoided if the condition were correctly diagnosed. While no single sign or symptom is pathognomonic for the diffuse variety of pleural mesotheliomas, certain combinations can be highly characteristic. Thus

non-productive dry cough associated with an extreme degree of dyspnœa, pain in the chest wall and rapidly accumulating pleural effusion are reported[4, 6, 8, 20] to be fairly characteristic of the diffuse pleural mesothelioma. This is particularly true when no elevation of temperature is present and when the withdrawal of pleural fluid does not bring the expected relief as it does in tuberculosis. With repeated withdrawals, effusion becomes increasingly hæmorrhagic.[20]

The quality of pain has been reported to be different from the pain commonly associated with other diseases of pleura or lung. Thus Barrett and Elkington[18] claimed that in the two cases reported by them "the pain was constant and gnawing in quality, unaffected by respiration or coughing; it was situated first in the axilla and was felt to be in the chest wall itself. It gradually spread to a wide field and was felt in an area which was anæsthetic to external stimuli." All these features suggested to them that the pain was due to involvement of nerves rather than to irritation of the pleura. The same authors maintained that the outstanding feature in patients with mesotheliomas is the simultaneous occurrence of signs pointing to involvement of both the respiratory and the nervous systems. While the respiratory system signs indicate a very marked, progressive and diffuse thickening of the pleura with little evidence of involvement of the lung itself, the nervous system signs are those of wasting and complete paralysis of certain of the intercostal muscles on one side and of the upper segment of the abdominal recti and oblique muscles. The diaphragm on the same side is immobile and the sensory disturbances are marked. The latter is limited to a precise area which extends to the midline in front and corresponds to the motor loss above and below. Posteriorly the sensory loss is severe and equal for touch, pain and temperature. All other nerves and reflexes are normal. Other investigators[4, 20] reported that the pain at first is intermittent and gnawing, becoming constant only gradually.

Dyspnœa seems to occur commonly,[4, 6, 8, 18, 20] but while some authors believe it appears early,[4, 18] others comment[8] on its late occurrence. The same applies to cough and pleural effusion. However, there is general agreement on the quality of the cough. It is reported[4, 6, 8, 18, 20] to be dry or non-productive. The temperature is normal but the ratio of the pulse to the respiratory rate is increased.[20] At times, cyanosis may be present and the presenting picture may be similar to that seen in a late stage of cardiac disease or advanced tuberculosis. The affected hemithorax is usually immobile, dull to percussion throughout with bulging of intercostal spaces.[6, 20] Retraction of these spaces may also occur[6] and after the aspiration of fluid from the pleural cavity these spaces become narrow. The mediastinum is commonly shifted to the contralateral side. Often the breath sounds are absent over the affected areas, but when the effusion does not fill the pleural cavity completely, moist rales may be heard in the upper chest.[20]

It has been reported[6, 20] to be difficult to perform a chest aspiration and that force must be exerted on the needle, in patients with diffuse pleural mesothelioma, since resistance is met with when it reaches the thickened pleura.

Occasionally the mass can be felt on palpation either as a region of thickening or as a definite demarcated tumour protruding between the ribs or surrounding the bone.[6] Some authors[18] consider narrowing of the intercostal spaces with a widened thorax to be characteristic in patients with diffuse mesothelioma. Its differentiation from other intrathoracic neoplasms may be difficult. In pulmonary tumour, however, pain occurs late and in bronchogenic carcinoma there is a persistent and irritating cough with frequent hæmoptysis. This latter is extremely rare in pleural mesotheliomas.

The nature of the pleural fluid in the early, non-hæmorrhagic phase of the effusion may have some diagnostic value. It has been noted that the pleural fluid in cases of diffuse mesotheliomas and the tumour masses themselves contain large amounts of mucoid material.[10, 21, 22] This consists mainly of hyaluronic acid. Our case illustrates this point very well, for the secretion present within the tumour masses gave negative results with mucin stain (Fig. 6), but a positive result for the presence of acid mucopolysaccharides (Fig. 5). Tramujas,[21] when operating on a patient with diffuse pleural mesothelioma, noticed that this abundant mucoid fluid resembled synovial fluid. Meyer and Chaffee[22] examined the viscous fluid from a patient with a mesothelioma of the pleura and peritoneum. They isolated hyaluronic acid from the fluid and found that "the yield per 100 c.c. of fluid corresponded to 0.174%, 0.187% and 0.142% as compared to 0.02-0.25% from bovine synovial fluid and about 0.04% from bovine vitreous humor." Bovine synovial fluid and vitreous humor normally contain hyaluronic acid in these concentrations.

There is an isolated mention in the older literature[20] of a high lipid content in the pleural exudate accompanying the diffuse mesothelioma. It was thought to be characteristic of this tumour. Other investigators have made no comment on this statement.

Radiographs may be of some diagnostic value but success depends on whether or not the entire pleural cavity is filled with fluid, and whether the tumour has reached a certain thickness. Thus what is most commonly reported by roentgenologists is the massive pleural effusion with a corresponding shift of the mediastinum. After withdrawal of the effusion, a thickened pleura may be seen. Some[8] maintain that the characteristic finding is a dense shadow having its base at the ribs and its apex pointing toward the mediastinum. The margins of the shadow are (presumably) smooth and the base is usually moulded to the contour of the chest wall. A primary tumour of the rib must be considered

in cases where a central area of destruction or erosion of the bone has taken place. Nodules, if seen, may be mistaken for metastases.[6] In the case reported here the roentgenologist believed that the localized areas of increased density were probably due to localized tags projecting from the parietal pleura and stated that it would not be possible to exclude the diagnosis of tumour deposits.

Experienced exfoliative cytologists can be of great diagnostic assistance but on the whole the definite recognition of characteristic cells may be extremely difficult. This subject has been extensively reviewed recently by Saphir[23] and Foot.[24]

Despite the fact that diffuse pleural mesotheliomas metastasize relatively late, there is no effective treatment. Irradiation of pleural and peritoneal diffuse mesotheliomas has been attempted and reported by numerous authors[4, 6, 24] but even when temporary relief was noticed in some patients and even when symptoms and tumour masses disappeared temporarily,[24] the ultimate outcome was not cure but recurrence followed by death. The same result was observed following surgical removal of masses by peeling the tumour from the pleural surface.[6, 21, 25] Treatment with radioactive colloidal gold[4, 26] and methyl-bis-(beta-chlorethyl)-amine hydrochloride[4] has been attempted with equivocal results. Some authors, therefore, urge early diagnosis[18] in order to save patients extensive and exhausting but useless treatment in the diffuse variety of pleural mesothelioma.

SUMMARY

A case of diffuse pleural mesothelioma in a 52-year-old woman has been reported in which the patient died within one year from the onset of symptoms.

Our patient had findings which we believe characteristic: extreme dyspnœa, non-productive cough, aching pain in the lateral chest wall, normal temperature, and increased respiratory rate. The non-hæmorrhagic pleural effusion present reaccumulated very rapidly and the secretion produced by the tumour cells showed a high content of mucopolysaccharides but failed to stain for mucin.

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PUCK ANEURYSM*

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INJURIES in ice hockey are insufficiently typical to give rise to medical slang in line with "sports car elbow" and "hula hoop syndrome", but we have recently encountered in amateur hockey players two examples of a lesion which we believe may be fittingly identified in the title of this report. Both lesions were traumatic pseudoaneurysms of the superficial temporal artery. Neither was diagnosed with assurance until removed and examined histologically, although in each case the history of trauma was unequivocal: each patient had within recent months been struck in the head by a hockey puck.

CASE 1.—This 23-year-old university student was struck on the left side of the head by a hockey puck on February 22, 1958. He was knocked off his feet but did not lose consciousness. Immediately afterward, considerable contusion developed, but subsided within about one week, by which time a small nodular pulsatile swelling was noted at the site of injury. This swelling grew gradually larger. It was neither painful nor tender.

On examination, a firm rounded nodule was visible within the "sideburn" area of the scalp about two to three fingers' breadths antero-superior to the left external auditory meatus. This nodule moved freely with the scalp upon the deeper tissues; the overlying epidermis could be moved only slightly upon the surface of the nodule. Pulsation was appreciable only when the lesion was pulled downward toward the zygomatic arch.

At operation, on April 22, 1958, the lesion appeared as an ovoid "blue-domed" cyst-like structure lying immediately deep to the scalp. Vascular pedicles were encountered at each extremity of the lesion. Bleeding was brisk until these pedicles were ligated and sectioned; the lesion was then dissected free without difficulty.

*From the Departments of Pathology of the University of Ottawa and the Ottawa General Hospital.

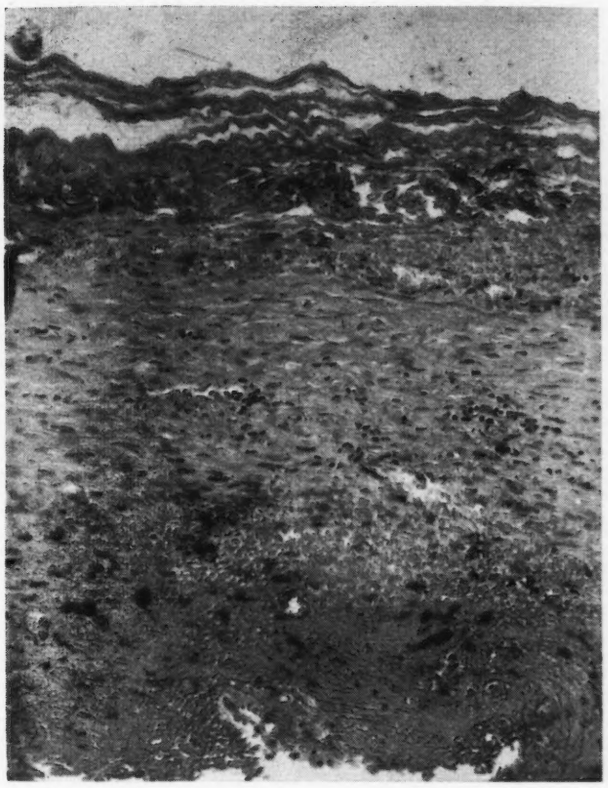

Fig. 1.—Wall of pseudoaneurysm composed largely of scar tissue. Here the lumen is lined by organizing thrombus. At the top of the field lies dense fibrous connective tissue contiguous with the adventitia of the involved segment of temporal artery. × 150.

Pathological Examination

Grossly, the lesion was an ovoid sac measuring about 1.0 x 0.7 x 0.7 cm. with thin but tough greyish-white membranous walls enclosing clotted blood. Microscopically, the walls of the sac were composed of granulation and scar tissue riddled with hæmosiderin deposits. The sac was bordered in areas by dense fascia and skeletal muscle, and was lined by organizing thrombus (Fig. 1). At one extremity of one of the sections the wall of the sac incorporated the media and the internal elastic lamina of a medium-sized muscular artery. The adventitia of this vessel was continuous with the outer coat of the lesion.

CASE 2.—This 19-year-old township clerk was struck in the left fronto-temporal region by a hockey puck at an unstated time during the winter of 1957-1958. Loss of consciousness was not recorded. Subsequently, a persistent nodular swelling developed at the site of injury. This nodule was neither painful nor tender, but its presence "annoyed" the patient when he lay on his left side in bed. On examination, a soft, fluctuant, non-pulsatile freely mobile lump measuring about 1.0 cm. in diameter was visible in the left temporal region about two fingers' breadths above the lateral end of the eyebrow. The lesion was removed on April 29, 1958.

Pathological Examination

Grossly the lesion appeared as a small, firm, saccular dilatation upon a blood vessel. The lesion was spherical and measured 0.4 cm. in diameter. It contained clotted blood. Microscopically, the walls and lumen of the lesion were in continuity with those of a medium-sized muscular artery (Fig. 2). The histological structure of the wall was identical to that of the lesion described in Case 1.

COMMENT

Traumatic pseudoaneurysms arise when rupture of a vessel wall, classically an artery, is incomplete, permitting the adventitia to contain the consequent hæmorrhage; in the event of complete rupture, they occur where the vessel is so firmly supported by dense connective tissue that bleeding is localized.[1] In our Case 1, the lesion was evidently obscured for about a week by contusion; a similar event is implied in Case 2. The gradual enlargement of the lesion in Case 1 may be attributable to gradual yielding of the fibrous walls of the sac to arterial tension, but it is curious that this lesion was felt to pulsate only when depressed towards the zygoma. Perhaps it had recently become cut off from circulation and merely transmitted the temporal artery pulsations. Why the sac in Case 2 did not enlarge or pulsate may possibly be explained by the thickness of its walls. In each case, the finding of absent or atypical pulsations balked the diagnosis.

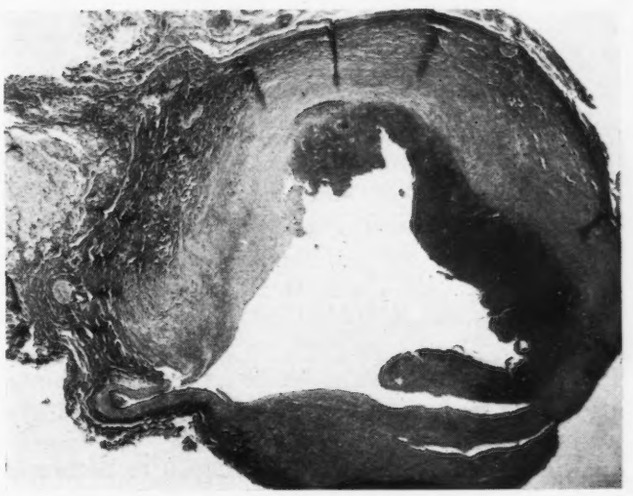

Fig. 2.—Traumatic pseudoaneurysm of superficial temporal artery (anterior branch). Note that the lumen of the artery communicates freely with the sac, but that the walls of the lesion are quite thick. Organizing thrombosis partially lines the sac opposite the artery. × 20.

Motor and industrial accidents, knife and bullet wounds, injuries in warfare and fist-fights, blows by balls and by sticks and canes, falls on the head, fencing and sabre duelling, arteriotomy, kicks by horses and pecks by roosters have been described as causes of pseudoaneurysms of the temporal artery.[2–5] So far as we are aware, blows by hockey pucks have not been implicated previously, but we would defend our use of the term "puck aneurysm" as a means of drawing attention to a potentially serious hazard in an internationally popular sport. Although it is well known that to be struck in the head by a hockey puck cannot be an entirely benign event, it is perhaps insufficiently appreci-

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ated that a regulation hockey puck weighs 165 grams and may travel at a velocity in excess of 120 feet per second.[6] When such a missile strikes the head, delayed as well as immediate sequelæ cannot be wholly unexpected. In the cases reported here, it may be felt that the patients got off lightly, but on the other hand, it can be pointed out that in both instances the injuries could have been prevented by the wearing of a suitably designed protective helmet.

SUMMARY

Two instances of traumatic pseudoaneurysm of the superficial temporal artery are reported in amateur hockey players who were struck in the head by pucks. These injuries could have been prevented by the wearing of protective helmets.

Dr. A. G. Watson, surgeon to the Hull-Ottawa Junior Canadiens, encouraged the writing of this report, and was so kind as to obtain data relative to the velocity of hockey pucks from the Montreal Canadiens organization. We are indebted to Drs. Alfred Larocque and E. W. Peterson for permission to include clinical data.

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LEPROSY: REPORT OF TWO CASES

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THERE have been five cases of leprosy in Alberta in the last ten years. The reported total in Canada for the same period was 15. Although it is uncommon in Canada, leprosy is a diagnosis to be borne in mind, particularly in patients coming from countries where it is endemic. The patient's country of sojourn is an important point to establish in the history, as the incubation period may be very long and the disease therefore not apparent on first arrival in Canada. The cases reported here illustrate the two main types of leprosy.

CASE 1.—V.G., a 39-year-old sister of the Russian Orthodox Church, was admitted to the University of Alberta Hospital in April 1958, for diagnosis of a skin rash. She gave the following history. She was born in Shanghai of White Russian parents, and lived most of her life in China. She left in 1951 and spent six months in the Philippines and three months in California. She then came to Canada and has spent the last six years in a convent in Alberta with other sisters of her order.

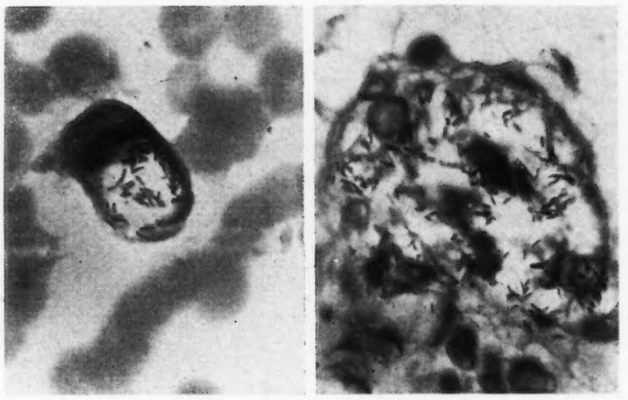

Fig. 1.—Case 1. Peripheral blood smear and bone marrow showing *Mycobacterium lepræ* with Ziehl-Neelsen stain.

Her symptoms began 18 months before admission to hospital with a raised red patch on her left cheek. This area spread to involve both cheeks and the forehead. She developed induration and discoloration of the skin of both hands and forearms, and of the feet and lower legs. She stated that her condition was aggravated by eating salted pork and herring. She thought that she tired more easily and that she had lost weight.

Physical examination revealed a remarkable copper-coloured induration of the skin of her face, the thickening being most noticeable over the nose and the supraorbital ridges. The eyebrows were absent. Similar changes in the skin had occurred on the extremities. There was generalized lymphadenopathy including palpable epitrochlear nodes. There was diminished sensation of light touch at the finger tips, but other sensory perception was unimpaired. The liver was enlarged to 2 cm. below the costal margin and the spleen was palpable. There were a few small crusted lesions on the finger tips and nostrils.

At this time a diagnosis of acute leukæmia was entertained, but her white blood cell count was 3750/c.mm. with a normal differential count, and smears of peripheral blood and bone marrow were within normal limits. In view of her history and her unusual leonine facies, the possibility of leprosy was suggested. On further questioning, she was unable to give a history of intimate or prolonged contact with lepers, but she thought that she might have had some indirect contact.

Smears of her nasal mucosa when stained by the Ziehl-Neelsen method demonstrated the presence of multiple acid-fast bacilli thought to be Hansen's bacillus (*Mycobacterium lepræ*). Similar bacilli were demonstrated in peripheral blood smears. This is stated to be a rare finding. They were also seen in smears of the bone marrow and in large foamy cells which were seen infiltrating skin biopsy specimens. Her hæmoglobin was 12.5 g. per 100 ml. and hæmatocrit value 40%. Serum cholesterol level was 128 mg. %. Sedimentation rate was 47 mm. in one hour. Blood Kahn test was positive in a dilution of 1:24, blood Wassermann ++. Treponema pallidum immobilization test was reported negative. Thymol turbidity was elevated to 16 units. Serum proteins were recorded as 7.5 g. %, with albumin 3.3 g. % and globulin 4.2 g. %. Her cephalin cholesterol flocculation test was reported as 3 plus in 24 hours

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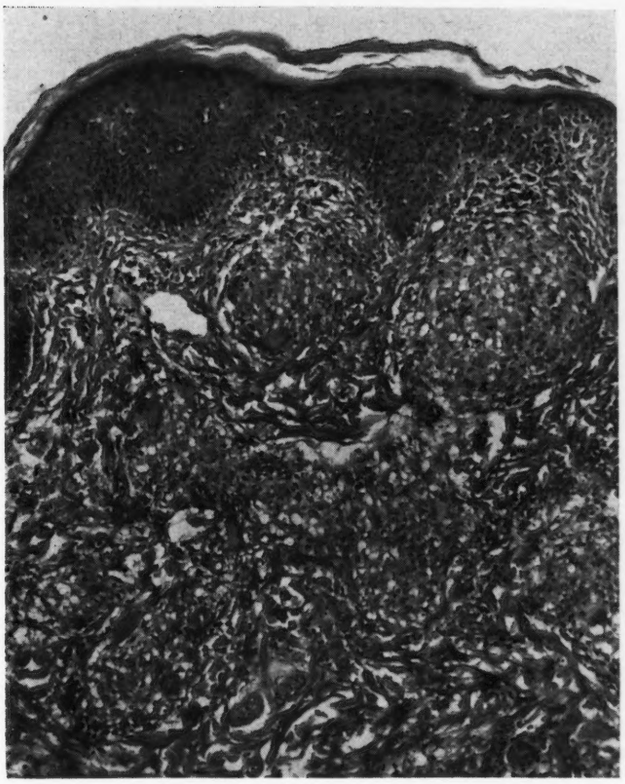

Fig. 2.—Punch biopsy of skin showing chronic granulomatous reaction with Langhans' giant cells in the dermis.

and 3 plus in 48 hours. Serum alkaline phosphatase was within normal limits. Urine was negative for sugar and albumin. Radiographs of chest, hand and feet were negative.

She was transferred to the Leprosarium at Tracadie, New Brunswick, where she is now under treatment and making a good recovery.

CASE 2.—J.W., a 9-year-old Chinese boy, immigrated to Canada with his mother three years ago, the father having lived here for 30 years. A few months after his arrival a raised erythematous area developed on the extensor surface of his right forearm. It was not tender or itchy and gradually increased in size over the next two years in spite of various local medications. Weakness in grasp of the right hand in the previous three months had led to his referral.

He was a well-developed, cheerful boy. There was a hypopigmented area involving the posterior aspect of the right forearm and extending from the wrist to the elbow and slightly on to the anterior surface. This area was circumscribed by a raised edge a quarter of an inch (0.6 cm.) wide which was brownish-red in colour. The demarcated area was hypo-anæsthetic. The flexors of the wrist were weak. The thenar and hypothenar eminences were wasted. There was weakness of the interossei and opponens muscles. He was unable to extend the little and ring fingers of that hand. The ulnar nerve was palpable, tender and twice its normal size.

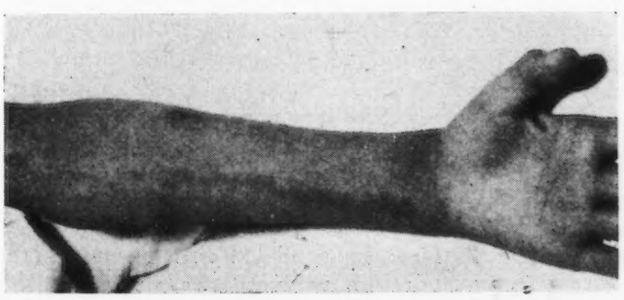

Fig. 3.—Case 2. Photograph of forearm showing the raised edge of the lesion and the wasting of the small muscles of the hand.

Investigations.—Hæmoglobin value 13.0 g. %; white blood cell count 5500; polymorphonuclear leukocytes 44%, eosinophils 4%, lymphocytes 9% and monocytes 3%. W.R. was negative. Skin scrapings were negative for *Mycobacterium lepræ*. Nasal swabs from the boy and his parents were negative. Punch biopsy from the raised edge showed a tuberculoid reaction consistent with a diagnosis of leprosy. No organisms were seen.

DISCUSSION

The International Congress of Leprosy in Cairo in 1938 and in Havana in 1948 classified leprosy into two major groups—the lepromatous and the tuberculoid. Resistance is low in the lepromatous group, and the organisms invade the skin, lymph nodes, nerves, bone marrow, liver and spleen. The first case falls into this group. She not only had involvement of all these organs, but a lepræmia as well. The prognosis in this group is poor, although it is thought that the outlook has been improved with sulfone therapy. Care must be taken at the outset of therapy to avoid a Herxheimer reaction.

The tuberculoid group have a high resistance and the organisms are hard to find. The tissue shows an allergic response to its presence. The second case is in this group. The contrasting features are best illustrated by Table I.

TABLE I

	Lepromatous	*Tuberculoid*
Sedimentation rate	High	Low
Wassermann reaction	Positive	Negative
Lepromin test	Negative	Positive
Presence of bacilli	Numerous	Scanty
Histology	"Lepra cells"	Tuberculoid response
Prognosis	Poor, up to 10 years	Good

The lepromatous type is potentially infectious and the patient should be in a leprosarium, not only to protect the public but also to have adequate medical supervision while being treated. The tuberculoid type is not infectious, and there is no need for isolation. Treatment can equally well be carried out at home. The word "leprosy" still carries with it a sinister aura, carried over from biblical times, in the minds of the lay public and unfortunately in many of the medical profession. Consequently, the force of public opinion may lead to the unnecessary isolation of those with the tuberculoid type of reaction.

SUMMARY

Two cases of leprosy are reported, which are representative of the two main clinical types of this disease.

We are indebted to Dr. J. F. Elliott and Dr. J. K. Martin for permission to publish these cases and to the Photographic Department of the University of Alberta Hospital for the illustrations.

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AN UNUSUAL CASE OF INFECTIOUS MONONUCLEOSIS*

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SINCE ITS original description in 1885 infectious mononucleosis (I.M.) has remained an interesting disease. The etiology is still obscure, although a virus is generally thought to be the infectious agent. As almost any organ or organ system can be involved in the disease process, the clinical picture not infrequently presents unusual and protean manifestations.

This case report was prompted because of the multiplicity of complications, one of which—ascites and œdema of the lower half of the body—has not to our knowledge been reported in the literature.

P.E., a white boy aged 5 years, became ill on January 19, 1958, with fever, general malaise and anorexia. He had several episodes of epistaxis and vomiting in the following days. The fever was irregular and paroxysmal in type. After one week he was seen by the family physician, who found an enlarged spleen, gave him a penicillin injection and prescribed sulfonamides for six days. As there was no improvement after another week, he was referred to St. Mary's Hospital on February 2.

The past history was not remarkable. He had had measles and varicella at the age of 3. There was no known recent contact with contagious diseases. All six siblings were healthy, as were the parents. No family member subsequently developed a disease similar to the patient's.

Physical Examination

The patient, a well-developed but rather small, pale boy weighing 36 lb., looked moderately ill. Temperature was 105° F. rectally, pulse rate 140, respiratory rate 24, blood pressure 94/50 mm. Hg. There was no skin rash, jaundice or detectable dehydration. The tonsils were slightly injected and several spots of whitish exudate were seen on the right tonsil. Moderate but definite generalized lymph node enlargement was present. The liver was enlarged by one finger's breadth, and the spleen extended two fingers' breadths below the left costal margin and was quite tender. The lungs were normal to percussion and auscultation. The heart was not enlarged and the heart sounds were normal. A grade 2 systolic blowing murmur was audible in the pulmonic area but was almost completely dispelled on deep inspiration. The central nervous system and ocular fundi, as well as the rest of the body, were normal.

Laboratory Findings

Hb. 10.0 g. %; the red blood cells numbered 3.54 millions/c.mm. and showed anisocytosis, poikilocytosis and microcytosis; no spherocytes were seen. Leukocyte count was 7350 of which basophils were less than 1%, neutrophils 62%, lymphocytes 23%, monocytes 10%, and unclassifiable mononuclears 5%. Erythrocyte sedimentation rate was 40 mm. (Westergren). Urinalysis was negative on several occasions. Throat culture grew *Staphylococcus pyogenes* and *Streptococcus pyogenes*. Several blood cultures taken during the first days were sterile. Tuberculin tests were performed at dilutions down to 1:100 and were negative. Chest radiograph was normal. The Paul-Bunnell test was negative on several occasions; the highest titre was 1:28 on February 17 and 24. Differential, cold and Widal agglutination tests were negative. Total serum protein was 4.7 g. %, albumin 3.15 g. %, α-1 globulin 0.3 g. %, α-2 0.4 g. %, β 0.4 g. %, γ 0.55 g. %. In a later study, the electrophoretic pattern showed return of all protein fractions towards normal values; their level was then 5.6 g. %.

Course in Hospital

During the first four days in hospital the temperature showed wide swings, occasionally exceeding 105° F. The liver increased to two fingers' breadths below the costal margin, and the spleen reached the umbilical line and was very tender. On February 5 a lymphocytosis of 72% developed (total W.B.C. 9350) but no Downey cells were seen. The same day the patient also developed a generalized scarlatiniform rash which first became confluent in many places and then hæmorrhagic (Fig. 1). Several purpuric spots were seen on the palate. On February 7, the temperature returned to normal, the rash began to fade, and a blood smear revealed that 19% of the differential count was made up of typical Downey cells and 77% of lymphocytes. Platelet count was 193,800/c.mm. and reticulocytes amounted to 3.9%. Cephalin-cholesterol flocculation was +/24 hours and ++/48 hours; thymol turbidity was normal. On February 11 the blood smear was again consistent with I.M., platelets were 150,000, the Hb. was 9.4 g. % and the reticulocytes were 12%; R.B.C. showed anisocytosis, poikilocytosis, microcytosis and macrocytosis, polychromasia and stippled cells. The same day a temperature of over 106° F. developed, subsiding in two days. As the patient's oral intake was poor, he was started on intravenous fluids; he also received intravenous penicillin and intramuscular novobiocin to control or prevent secondary infection in face of the severity of the disease. In spite of the antibiotics, fever developed again on February 19

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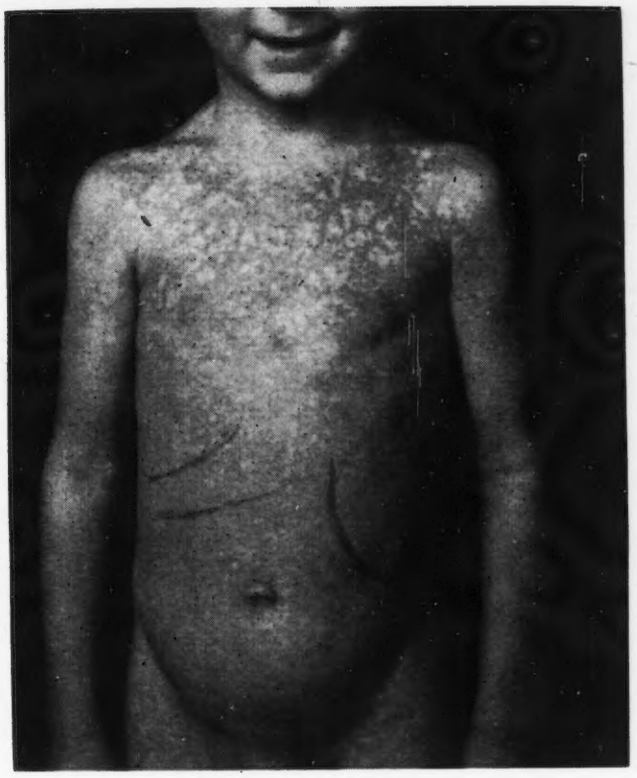

Fig. 1.—Appearance of hæmorrhagic rash on February 8, 1958.

and penicillin and novobiocin were then discontinued. The fever persisted with wide fluctuations, occasionally exceeding 105°-106° F., until February 24. On February 19, Hb. was 9.1 g. %, smear was typical for I.M., and heterophil agglutination had risen to 1:28 (Table I). By February 19 a new skin rash appeared, maculopapular in nature, which quickly spread peripherally, became confluent and hæmorrhagic and disappeared gradually over the next two weeks. On February 22 he complained of pain in the right lower chest and right upper abdominal quadrant. Examination revealed some dullness in the right lower chest, and the liver and spleen were enlarged to 2½ fingers' breadths and tender; the abdomen appeared protuberant. Chest films showed a small amount of fluid in the right pleural cavity (Fig. 2). On February 24, cephalin-cholesterol flocculation was trace/24 hours, + +/48 hours, thymol turbidity negative, and total bilirubin 0.5 mg. %; Hb. had fallen to 6.7 g. %. While the fever subsided, the abdomen increased in size and pitting œdema of the lower abdominal wall appeared. Because of clinically obvious ascites, an abdominal paracentesis was performed which yielded 800 c.c. of bloody fluid containing 2.6 g. % protein, 121 mg. % sugar, 680,000 erythrocytes/c.mm., and 10 lymphocytes but no malignant cells. Culture of this fluid was sterile. Electrophoresis at this stage: total proteins 4.7 g. %, albumin 3.15 g. % and globulins 1.55 g. %; the proportion of the globulin fractions was preserved at a lowered level. The site of paracentesis drained for several days but no reaccumulation of ascites took place. However, gross œdema of the lower abdominal wall, scrotum, penis and legs became evident. This œdema of the lower half of the body gradually receded and had completely subsided by March 6. The liver then was 1½ and the spleen 2½ fingers' breadths enlarged and a chest film showed disappearance of the pleural effusion. From then on he did well and went home on March 10.

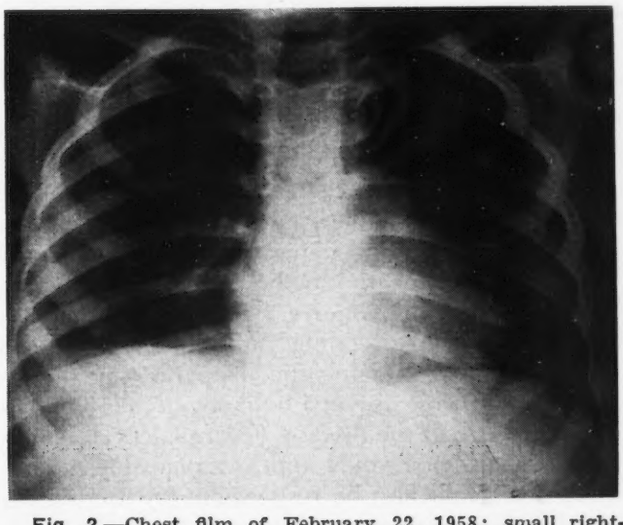

Fig. 2.—Chest film of February 22, 1958: small right-sided pleural effusion.

He was seen again one year later, in May 1959. He was doing well and had gained over 5 lb. although for several months after discharge he had tired easily. The findings of physical examination were entirely within normal limits except for a slightly enlarged and hardened spleen. The hæmogram was normal and the Paul-Bunnell test showed no titre (see Table I). Electrophoretic pattern was normal with total proteins 6.5 g. %, albumin 3.85 g. %, α-1 globulin 0.25, α-2 0.6, β 0.8, and γ 1.0 g. %.

DISCUSSION

The diagnosis of infectious mononucleosis is definitely established if clinical, hæmatological and serological findings are positive. However, many cases fulfil only the first two of the above criteria. In different series the Paul-Bunnell test is reported positive in from 43% to 100%.[1] Bender[2] carefully analyzed the blood findings in 200 cases of proven I.M. and came to the conclusion that (1) 99.6% of cases have 20% or more atypical lymphocytes (1400/c.mm. or more in absolute count of these cells in the peripheral blood); (2) in 98.2% of cases the neutrophils account for 49% or less of the leukocytes. He makes a plea for greater confidence in making the diagnosis on the basis of the blood findings in conjunction with the clinical picture. Sero-positivity or sero-negativity as well as titre of the Paul-Bunnell test bears no relation to the severity of the disease. Kaufmann saw titres of 1:1792 and 1:3584 in patients who were not ill enough to stay in bed.[1]

Results of liver function tests are reported abnormal in from over 40% to almost 100% of cases[3] but showed only slight impairment in our case, and jaundice was not observed clinically or biochemically. Sullivan[4] found fairly consistent electrophoretic changes in the serum protein pattern: decreased albumin, increased β-globulin, changes in α-2 and abnormal proteins migrating

TABLE I.—HÆMATOLOGICAL AND SEROLOGICAL DATA

	1958								May 25, 1959
	Feb. 3	Feb. 5	Feb. 7	Feb. 11	Feb. 17	Feb. 24	Feb. 28	March 5	
Hb. (g.%)	10.0		10.3	9.4	9.1	6.7	9.1	9.1	13.6
E.S.R. (mm. in one hour)	40		25	42					
Reticulocytes (%)			3.9	12				15.2	
Platelets/c.mm.			193,800	150,000					
Total W.B.C./c.mm.	7350	9350	11,000	6200	7700	8500	6800	5200	6400
Basophils %	<1	—	—	—	—	—	—	<1	—
Eosinophils %	—	3	5	0	1	7	2	4	4
Neutrophils %	62	25	14	50	8	34	34	23	44
Lymphocytes %	23	67	58	34	70	48	57	58	46
Atypical lymphocytes %	—	—	19	12	19	—	4	—	—
			(2090)		(1463)				
Monocytes %	10	<1	4	2	2	7	2	13	6
Unclassifiable monocytes %	5	5	—	2	—	4	<1	2	—
Paul-Bunnell test	no aggl.		1:7		1:28	1:28			no aggl.

between α-2, β- and γ-globulin. We saw only a moderate decrease of all protein fractions and a return towards normal values during recovery.

Because of the well-known similarity of *Listeria monocytogenes* infection to the clinical picture of I.M., several blood cultures were taken during the first days in hospital but were sterile. Serological studies performed on the 42nd day of illness revealed a titre of 1:320 to Patterson serotype 2 and 1:80 to serotype 4. Three weeks later these titres had decreased to 1:40. Stool and urine culture also remained negative for this organism. It is known that antibodies to *L. monocytogenes* are not uncommonly found in low dilutions of sera from apparently uninfected humans and animals. Seeliger and Sulzbacher[5] state that in the majority of these titres in normal, healthy individuals there is no bacteriological evidence of *Listeria monocytogenes* infection, and reciprocal and unilateral cross-reactions between *Listeria monocytogenes* and other bacteria are known (e.g., *E. coli K8*, *Streptococcus fæcalis* group and *Staphylococcus aureus*). These authors recommend caution in the interpretation of positive titres and in acute cases only titres which initially rise and then fall should be considered consistent with the diagnosis of infection. In view of our findings we did not feel justified in diagnosing the case as listeriosis.

The unusual type of skin rash also made us include the acquired form of toxoplasmosis in the differential diagnosis. So far six cases of the exanthematous type have been described.[6] These patients, however, had maculopapular rashes covering the whole body except the palms, soles and scalp; all had clinical signs of pneumonia, four had definite signs of central nervous system involvement, none had clinical hepatosplenomegaly, only one showed lymphadenopathy and all ended fatally.

In a disease which usually produces marked and characteristic signs and symptoms the clinical features are of paramount importance and more reliable than certain laboratory findings, particularly in an infectious disease in which the causative agent is not known and cannot therefore be isolated. Considering the clinical side of our case, one could hardly think of a more characteristic picture of I.M.; in particular, the development of several typical complications pointed to that diagnosis.

Pleomorphic skin rashes are observed in 15-20% of cases, although hæmorrhagic rashes are less common and usually appear during the first three weeks. Anæmia was present on admission and reached its peak at the height of the illness. The hæmolytic nature was evidenced by a reticulocytosis of 12%. A Coombs test was not performed, but this test is reported positive in three out of four cases of hæmolytic anæmia complicating I.M.[7] The first definite observation of pleural effusion in I.M. was recorded by Vander in 1954.[8] Briggs[9] observed a right-sided hæmorrhagic pleural effusion in a 24-year-old woman.

The ascites and œdema of the lower half of the body were puzzling to us, as we were unable to find a description of this complication in the literature. Ascites developed at the same time as the right-sided pleural effusion, and œdema of the lower half of the body became evident when the ascites was receding; therefore the changes leading to what initially looked like portal hypertension could not have been limited to the portal vein or circulation alone. Apart from that, intrahepatic obstruction appeared unlikely as there was only moderate liver involvement. Portal vein thrombosis also seemed improbable, as recovery from this complication was fast, and one year later the patient showed no signs of impairment of portal blood flow. Cellular infiltration of pleura and peritoneum would have been possible but would not account for the œdema of the lower abdominal wall, scrotum and legs. Our case certainly was similar to Chiari's syndrome, in which there is obstruction to the venous return in the hepatic veins and inferior vena cava leading to portal hypertension and œdema of the lower half of the body. The most common lesions leading to Chiari's syndrome are hepatic vein thrombosis extending into the inferior vena cava or tumour compression. Hepatic vein thrombosis in our case is very unlikely because of the benign course of the disease. Enlargement of lymph nodes at this level would appear a plausible explanation and could also be responsible for the pleural effusion through pressure on the azygos vein, lead-

ing to increased pressure in the bronchial veins with consequent pleural transudation. (Vander also explained the pleural effusion in his case on this basis.) Roentgenogram of the chest, however, did not reveal hilar lymph node enlargement. The hæmorrhagic nature of the ascites remains unexplained. It is interesting to note that Briggs's case[9] of pleurisy also showed a hæmorrhagic effusion.

SUMMARY

A five-year-old boy became unusually ill with infectious mononucleosis complicated by hæmorrhagic skin rash, hæmolytic anæmia and pleural effusion. He also developed an episode of ascites and œdema of the lower half of the body. This latter complication has not been previously described. Its pathogenesis as well as the differential diagnosis of infectious mononucleosis is briefly discussed.

The author records his thanks to Dr. J. H. O'Neill for permission to publish this case and to K. F. Girard, Ph.D., Department of Bacteriology, McGill University, for performing the serological studies.

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Montreal, Que.

SHORT COMMUNICATIONS

CLINICAL LANDMARKS IN ALCOHOL ADDICTION*

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THE WORD "addiction" has come to mean many different things to many different people. Those engaged in the clinical management of addiction can agree on at least one point, viz., that it is a complex human disability that cannot be easily described in a few words.

Usually, a physician has clinical "landmarks" which assist in his orientation to a particular disease. These "landmarks" enable him to visualize the various aspects of the disease process and permit him to estimate the duration of the illness, the method of treatment, prognosis, and so on.

This paper is to demonstrate a chart that attempts to supply some "landmarks" to assist in clinical orientation to alcohol addiction. For the purposes of this paper, addiction is simply defined as a harmful dependence upon one or more chemicals. The nature of the "harm" produced by addiction will vary with the chemical involved. For example, food and tobacco addiction can produce significant physical changes but few important mental or social changes. Since addictions of this type do not produce a socially undesirable change in behaviour, they are not regarded as particularly threatening to the community as a whole. On the other hand, addiction to alcohol, barbiturates and tranquillizers can produce serious changes in all three areas — physical, mental and social. There are many reasons for this, but two stand out. First, these chemicals can so affect the brain as to produce the phenomenon of "drunkenness". Drunken behaviour is unacceptable in most communities. Secondly, with addiction to alcohol, "drinking" eventually replaces other activities in the home, on the job, in the community, in contrast to addiction to tobacco in which "smoking" is superimposed upon these other activities without replacing them.

This paper supports the thesis that an addiction should be examined from nine different standpoints: the physical, psychological and social situations existing prior to the beginning of a harmful dependence; the physical, mental and social changes arising out of a harmful dependence; and the physical, mental and social situations after the harmful dependence has been discontinued.

With this orientation, the accompanying chart should be self-explanatory. An attempt has been made to indicate the physical, mental and social status before, during and after alcohol addiction. The following features of the chart are considered worthy of special mention:

A. THE PHYSICAL SEQUENCE

1. *Before*

A certain physical state must be present to permit alcohol addiction to develop. Thus, the person who is incapable of enjoying any welcome effect from alcohol, regardless of dose, will not become addicted to alcohol.

2. *During*

All of the significant physical abnormalities arising out of a harmful dependence upon alcohol occur in either the nervous system or the digestive system. Most of these changes are permanent rather than temporary, e.g., those responsible for withdrawal reaction, pathological intoxication, cirrhosis, Wernicke-Korsakoff syndrome. Accordingly, the symptoms of these abnormalities indicate a permanent intolerance for alcohol.

Drinking may be either continuous or sporadic — "chronic or bout". The change from chronic to "bout" drinking usually represents a break in nervous system or digestive system tolerance — rather than a new psychological phenomenon. In

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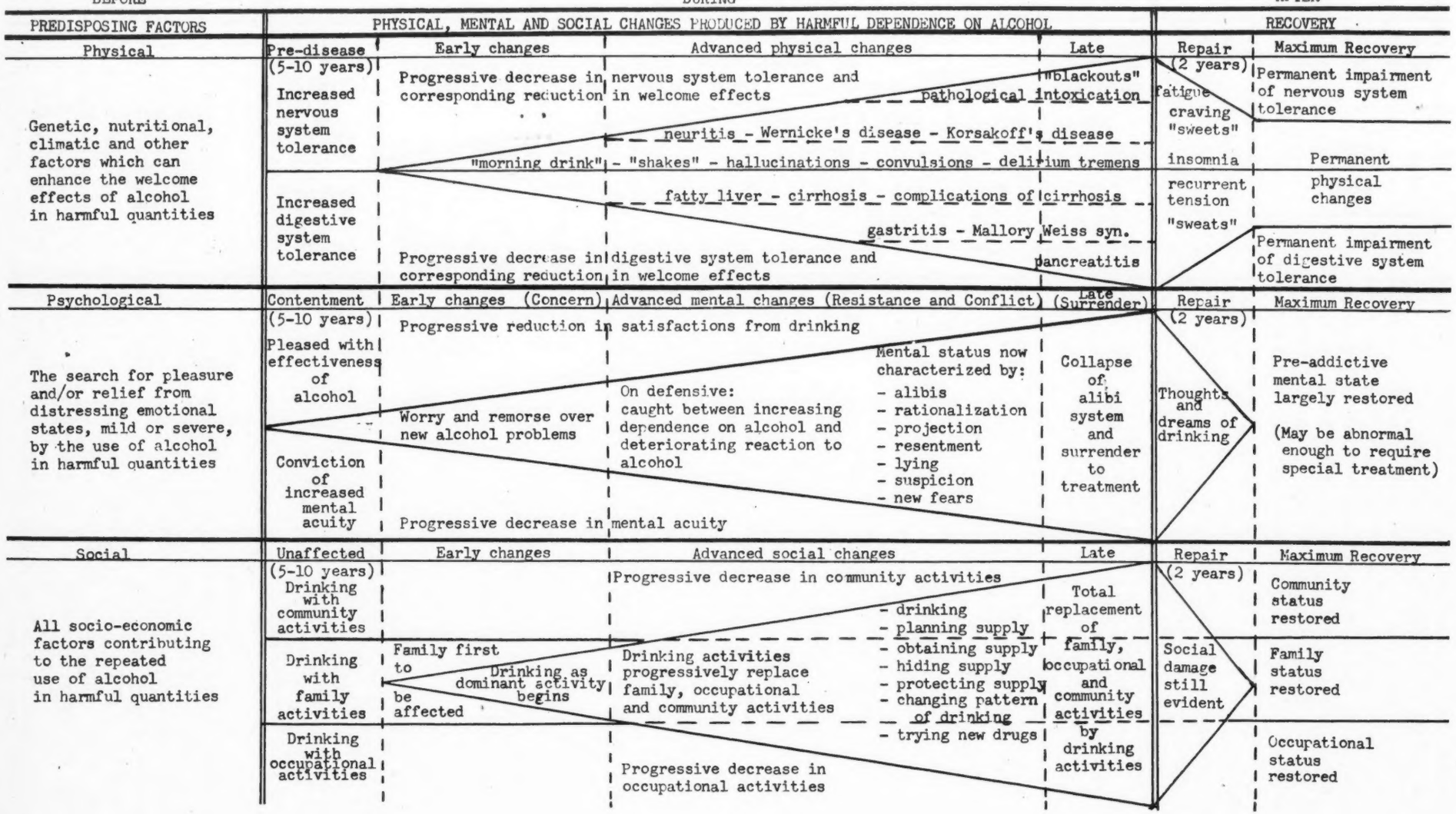
ALCOHOL ADDICTION

(A harmful dependence on alcohol)



other words, the alcohol addict usually continues to drink regularly as long as his brain or stomach can stand it.

The "blackouts" are deliberately represented as a manifestation of a late rather than an early physical change. Actually, they may occur either early or late in the addiction experience. Too many people automatically associate drunkenness with alcohol addiction. However, when alcohol addiction is recognized at an early age, it is usually because drunkenness and "blackouts" do occur as an early manifestation of a harmful dependence on alcohol. A harmful dependence upon alcohol can be maintained for years without obvious impairment in physical or social status. In such cases, practically the only indication of a significant physical change would be the need for the "morning drink".

3. *After*

The chart indicates that a period of physical repair of approximately two years' duration is consistently indicated, regardless of the combination of physical changes in a particular case. Some of the symptoms experienced during this period are indicated, plus the fact that maximum recovery falls far short of anything that would permit a return to normal tolerance for alcohol.

B. THE PSYCHOLOGICAL SEQUENCE

1. *Before*

It is important to emphasize that both the search for pleasure and the relief from distressing emotional states can provide the psychological component of the "seed-bed" for alcohol addiction. The distressing emotional states can vary from those considered too mild to be of clinical significance by themselves to the grossly distressing emotional states of severe neurosis or psychosis.

2. *During*

An attempt has been made to indicate that the satisfactory experience of drinking introduces a new element into the thought and emotional life of the patient. The new mental activities concerned with the use of alcohol begin to modify the personality of the drinker, particularly when he begins to be in trouble because of a breakdown in tolerance or in social approval. Eventually, alcohol addicts begin to resemble one another because of the similarity of the thought patterns that accompany later stages of alcohol addiction. This means that the pre-addictive mental state becomes "blurred" and finally "covered over" by the thinking arising out of the addiction.

In the chart, we indicate that the alcohol addict eventually achieves a "phase of surrender" in which there is a collapse of his alibi system and a willingness to accept help. Prior to this development, he goes through a long period during which he attempts to hold on to his addiction with one hand and his family, occupational and community position with the other.

I am personally convinced that only a small minority of the alcohol addict population resolve this conflict in the manner indicated on the chart. I am also convinced that the great majority of alcohol addicts either die prematurely by suicide or other causes while the conflict is still being actively engaged, or they surrender completely to the addiction like the "skid row" habitué. The tragedy is that most of these could be successfully treated if they could first be freed from the self-perpetuating mental mechanisms of the phase of "resistance and conflict".

3. *After*

The chart also indicates that the reappearance of the pre-addictive mental state during recovery may reveal the presence of long-standing psychological problems sufficiently abnormal to require special treatment.

C. THE SOCIAL SEQUENCE

1. *Before*

Many communities have established drinking patterns involving the repeated use of alcohol in harmful quantities. A harmful dependence upon alcohol can be more readily developed in such a setting.

2. *During*

It is important to emphasize that very frequently a family can be practically destroyed without any apparent change in the community and occupational situation. It is also important to realize that absenteeism, as a result of a harmful dependence on alcohol, is practically never an early indication of alcohol addiction.

3. *After*

The chart indicates complete repair of the social changes in the two-year period. This is the ideal state and possible only if the addiction has been interrupted before gross social changes have occurred. Many family and work situations have been so completely broken up as a result of a dependence upon alcohol as to be irreparable. Thus, in any particular case, there could be a residue of permanent social changes as well as permanent physical changes.

It is the responsibility of the physician to explain alcohol addiction clearly to those who are dependent upon alcohol. The industrial physician, rather than the foreman or the supervisor, must assume the responsibility for early recognition of alcohol addiction in the industrial setting. If the physician assumes the same attitude towards the investigation and the treatment of the victims of addiction as he does to the victims of infection, the community as a whole will follow his lead toward more effective solutions to these complicated disabilities.

RÉSUMÉ

Plusieurs maladies au cours de leur évolution présentent un tableau clinique qui varie à différents stages et permet au médecin de reconnaître la durée et l'étendue de la lésion et de formuler un pronostic. Il en va de même pour l'alcoolisme et l'auteur a établi des repères sur les plans physique, psychologique et social, permettant d'adapter le traitement au degré de dépendance atteint par le malade.

A PROMETHAZINE-EPHEDRINE COMBINATION FOR RELIEF OF RESPIRATORY ALLERGIES

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THE SUFFERER from bronchial asthma has a two-fold problem: to prevent attacks by avoiding everything to which he is sensitive or by becoming clinically non-sensitive, or to have available one or more preparations for symptomatic treatment in the period while his doctor is discovering his allergens and helping him deal with them, and which later he can confidently expect to relieve an occasional attack. None of the presently available preparations is so perfect for all patients that another effective one would not be a useful addition to our armamentarium.

A preliminary impression that a combination of promethazine (Phenergan) and ephedrine (25 mg. each per adult dose) is of value was presented[1] two years ago. Experiences reported here have confirmed this view. Each of these drugs will relieve many asthmatics but promethazine is too sedative for some patients and ephedrine sometimes proves too stimulating. Together they might largely neutralize each other's undesirable side effects but give greater relief than either one alone. Avoidance of barbiturates might well be an added advantage. Not only is promethazine antihistaminic and sedative in action but a recent study[2] has shown it to be "the only antihistamine whose inhibitory effect [on serotonin] was comparable to that of LSD-25 (lysergic acid diethylamide)", having about 95% the potency of LSD-25 and nearly four times that of the nearest antihistamines.

Since the report above mentioned[1] the writer has used this combination for approximately 125 patients and about 12,000 doses. Some have taken it as preferred prescription for relief of occasional attacks for as long as 2½ years with no evidence of failure of effect or of acquired intolerance. Earlier impressions seem to be borne out, and the vast majority of asthmatics who have used the preparation seem to get very good relief. Most of these patients were new patients but some had already used other prescriptions, even smoking stramonium-leaf powders.

No attempt has been made to gather statistics in the writer's cases for the following reasons: (1) Estimation of the value of the preparation originates with the patient and his subjective feelings. (2) This study is for the purpose of observing whether or not a large percentage of patients with respiratory allergies will receive temporary relief by using a new formula. No attempt is made to study the mechanism by which it works. A double-blind test of this formula was made by Dr. R. F. Hughes of Hamilton about two years ago in five cases of asthma. There was evidence that the attacks were relieved. Reference was made to this trial in my previous publication.[1] In a study such as this, where the patient himself administers the treatment and decides whether or not his distressing symptom is relieved, the best possible control is *not* another patient who does not take the prescription but the same patient and his condition before he has taken the treatment, as compared to his condition afterwards. This type of trial was first discussed by the late Sir Almroth Wright.[3]

A very few of the patients in my study complained of being either excited or made sleepy by the recommended dose. Most did not feel any unpleasant side effects. A few preferred other preparations and about the same number felt that the promethazine-ephedrine combination was the best preparation they had yet used. All in all, the clinical impression is that this is another useful combination for relief of asthma, and that it is sufficiently different (particularly from barbiturate-containing preparations) to make it the best method of self-medication for a good percentage of persons who have asthmatic attacks.

Although it was designed for the relief of asthma, it soon became apparent that the promethazine-ephedrine combination was effective in relieving many cases of pollenosis, allergic rhinitis, and "congestion headache" often associated therewith. As in asthma, it seemed to be the best treatment yet found for some patients; as good as presently available preparations in most cases, but not as good as others in a few cases. A similar conclusion to that noted for asthma would apply in these cases.

As with other prescriptions, the writer found some variation in optimum dose. One or two patients who got relief but were made quite sleepy by a whole tablet found that one-half tablet gave sufficient relief without drowsiness. One says that he takes a whole tablet if travelling by overnight train or staying in a hotel, because he gets "a good night's sleep with clear breathing". An occasional patient reports that he needs two tablets for good relief, and is not made particularly drowsy by such a dose.

Several Canadian allergists were each sent several hundred tablets of this preparation for evaluation and opinions. Statistical reports were obtained from four and these are summarized below:

Forty-eight patients had been treated, suffering from a variety of conditions including bronchial asthma, pollenosis, and perennial allergic rhinitis. Seven of these had eczema or urticaria as additional factors.

Twenty patients were reported as experiencing complete relief of symptoms; 16 received partial relief and 12 received no relief; 8 patients were made sleepy by the tablets (how sleepy this 17% became was not reported). Two others (children, 8 years old) were made sleepy by an adult-size tablet but not by half a tablet, so these are not included since 25 mg. is considered too large a dose for children. (One child of 14 with asthma vomited after each of four adult doses and received no relief.) In one series of 11 adults the only side effects were dryness of nose and throat in one patient, whose attacks however were more completely relieved than by other preparations, but who discontinued the tablets on account of the unpleasant side effect. Three of these 11 were completely relieved and the remaining eight experienced the usual partial relief which other preparations had given.

Omitting the seven cases where eczema or urticaria were additional symptoms, the four observers classified their results as follows:

	Better than average in	*Average degree of relief in*	*Poorer than average in*
	patients	*patients*	*patients*
A	9	6	3
B	3	0	2
C	2	2	3
D	3	8	0
	17 (41.5%)	16 (39%)	8 (19.5%)

One of the four observers commented: "I do believe that there is a definite place for this product in the armamentarium. I wouldn't want to be without it."

Another stated: "Generally speaking, apart from drowsiness, the combined use of promethazine and ephedrine produces results which are superior to those with other commonly used antihistamines."

Two other observers reported, though not so completely. One who apparently had his patients take the tablets only morning and night or only at bedtime, rather than at any time they were required to give relief, reported that 40% thought that they were of average benefit and 20% thought that they were better than average; 35% felt drowsiness as a side effect. The number of patients involved was not reported.

The other observer stated that the tablets were of value in the symptomatic treatment of asthma and capable of replacing other medications. He considered that it was sometimes desirable to get away from use of barbiturates and aminophylline. He reports one case as follows: "I have already reported a number of my cases to you, but in addition I have a follow-up report on one man who has been taking as many as 50 tablets in a two-week period. He shows no build-up of intolerance, and no decrease in the efficacy of the treatment. After several months it is still as effective in controlling his symptoms as it was originally."

The chief side effect seems to be drowsiness. The writer's patients and those of several of the other observers have considered this a minor effect, not worth mentioning, with one or two exceptions. One or two observers seem to report a larger percentage of drowsiness. This variance could be due to the emphasis placed on it by the doctor or his patient. For example, one may have asked the patient to report *any* drowsiness at all while others, only any *uncomfortable* or activity-restraining drowsiness.

As suggested in the preliminary report, unless and until this preparation is placed on the market as a single tablet, it may be prescribed as promethazine tablets (25 mg.) and ephedrine capsules (3/8 grain), with instructions for the patient to take one of each as one dose.

SUMMARY

On theoretical grounds a combination of promethazine (Phenergan) and ephedrine should have some advantage over preparations containing ephedrine and barbiturates presently available for relief of bronchial asthma, at least in some cases.

In the experience of the writer and several other Canadian allergists this has proven true not only for asthma but also in allergic rhinitis and pollenosis.

Drowsiness was noted as a side effect in some cases, but this did not require stopping the use of the prescription except in a very few. One patient used the sedative effect to his advantage.

Among the author's 125 patients (who used 12,000 doses) a promethazine-ephedrine combination was found better than other prescriptions in 41% as regards relief of respiratory allergies, equal to the others in 39% and not as good as the average in 20%. Six other investigators corroborated this clinical finding.

The Phenergan-ephedrine combination used in these tests was manufactured and supplied by Poulenc Limited, Montreal.

The author wishes to thank the following for their kindness in evaluating this preparation and making their reports and opinions available: Drs. G. Calder (London), J. G. Maclennan (Hamilton), R. F. Hughes (Hamilton), Sydney Pedvis (Montreal), C. J. Malloy (Montreal) and Bernard Manace (Toronto).

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ANOTHER PRESIDENTIAL INSTALLATION

When H.R.H. The Prince Philip, Duke of Edinburgh, was chosen as President of both the Canadian and the British Medical Associations, it was hoped that one joint installation ceremony in Edinburgh last July would have been sufficient to bring him into the two offices. But fate decreed otherwise, and our British colleagues found themselves obliged to wait until October 28 before they could complete the job begun by the Canadian Medical Association last June.

In accepting the presidency of the British Medical Association, Prince Philip was carrying on a tradition long established in Britain, where the Royal Family has for over a century been identified with an interest in medical progress. It may be recalled that Queen Victoria greatly helped to break the prejudice against anæsthesia by having chloroform herself for a confinement, while the Prince Consort was closely associated with the public health movement of Victorian days. Since then, each British monarch has had some association with the field of British medicine, and indeed the Great Hall of B.M.A. House, in which Prince Philip was installed on October 28, was the scene of the opening ceremony of the new building in 1925 by the late King George V and Queen Mary.

There is also a tradition that the royal patrons of British medicine have occasionally asked awkward questions. King Edward VII, on being told that tuberculosis was a preventable disease, remarked briefly "if preventable, why not prevented?". Prince Philip on the occasion of his installation in Toronto also asked awkward questions about the interest of the medical profession in physical fitness, and has recently sent a message to his Deputy asking what Canadian medicine is doing to investigate the fitness of the population. On October 28, though his installation address was not particularly controversial, he asked more awkward questions later in the evening when he rose to propose the toast of "The Common Health".

He defined the "Common Health" as the no man's land between positive good health and active bad health, and said bluntly that very little was known about the social diseases which attack a community. As an instance of this, he cited the case of juvenile delinquency, pointing out that it would be much easier to prevent this if there were more accurate knowledge of the cause of this unpleasant social disease. Research into social diseases would call for co-operation between the medical profession, other professions, the sociologists and the Church. The speaker admitted that he was no expert in these problems, and said that he might well be told by the experts that they already knew the answers. In that case, he would retort that they had been extremely unsuccessful in applying their knowledge to the problems.

A few persons may resent what they regard as the intrusion of a layman into the province of medicine, but the vast majority of members of both Associations will greet with joy the discovery that they have a President who is not afraid to speak his mind. In London, he said that his presidential address was merely a continuation of the one he gave in Toronto, and indeed both have much the same theme, that of urging the medical profession to broaden its horizons and to take into its field of interest matters which it has previously neglected. This should appeal particularly to Canadians, for within the space of a few decades, Canadians have been asked to lift their sights from the province to the nation, and from the nation to the whole world. It is to be hoped that our President will continue to ask us awkward questions and to needle us throughout his presidential term and beyond.

Editorial Comments

THE MEDICAL AUDIT

The medical audit provides one of the important means by which a hospital's objective of good medical care is achieved. The objective is realized in a direct way through the committee's evaluation of the performance of the medical departments, and indirectly through evaluation of the performance of the non-medical departments. A recent article[1-3] in a new hospital publication, *Hospital Administration and Construction*, deals with a particular hospital's experience on this subject and describes the parts played by the doctor, the medical record librarian, and the administrator.

The doctor's part in the medical audit program is that of evaluating the quality of medical care by a thorough review of the records of all patients. The formation of an audit committee which accepts the basic principles that the medical staff is responsible to the patient and to the board of governors for the quality of medical care, and that the medical staff is responsible for the quality of

medical care rendered to all patients in the hospital, was found to gain the confidence of the medical staff and did not encounter resistance or resentment. In order to steer clear of the accusation that they were a form of "secret police" or, further, that they trespassed on the doctor-patient relationship, the committee operated strictly as a fact-finding body and played no disciplinary role; included a broad representation of the medical staff with rotation of the representatives; kept meetings open to any member of the medical staff; and identified individual doctors only by code numbers whose names were unknown to the members of the committee.

The role of the pathologist is that of supplier of data. He does not generally participate in the discussion of purely clinical problems, and never assumes chairmanship of the committee.

How then can the audit committee be effective? Because its very existence encourages members of the staff to be thorough and accurate. Questions of policy or discipline are referred to the medical advisory committee; questions of clinical management are referred to the head of the clinical department concerned.

The audit committee described concerned itself first with tissue evaluation and developed a code for the orderly classification of all surgical operations. After this, it ventured successfully into the more difficult area of medical audit, beginning first with a code for the evaluation of deaths, and then studying miscellaneous subjects—duration of tonsillectomies, incidence and prevalence of infections, length of hospital stay, management of duodenal ulcer.

The second participant, the medical record librarian, has the task of securing, preserving and using medical records—the foundation for an effective audit. The quantitative and qualitative requirements for medical records followed standards set by the Canadian Council on Hospital Accreditation. The records must contain sufficient recorded evidence to justify the diagnosis and warrant the treatment and end results.

The librarian also compiles the regular statistics such as the average length of stay per service or the incidence of infections.

An adequate surgical classification code and a code for the evaluation of death are presented. Medical audit check sheets (based on the check sheet of the American College of Surgeons and the Commission on Professional and Hospital Activities, Inc., Ann Arbor, Michigan) enable the auditor to grade the general management of the case stated as excellent, adequate, fair or poor.

Finally, the administrator has the difficult task of creating and maintaining an environment of cooperation to the end of achievement of hospital objectives. The science of administration requires that he be able to "produce the facts" concerning the fundamentals of hospital organization, policy and rules, accreditation standards and principles, and budgetary control. This must be intertwined with and complemented by the art of administration wherein the administrator must try to understand the medical profession, its role in changing society, and social trends, and to dispel any fears that the assumption of a medical audit program will lead to "lay domination".

It is felt by the hospital described that within two years the tissue and medical audit committee had achieved that very delicate balance between respect for the inviolability of the doctor-patient relationship and the hospital's responsibility for rendering medical care of a high standard to the community.

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SERUM VITAMIN B_{12} CONTENT AS AN INDEX OF HEPATIC DAMAGE

Experimental hepatic necrosis in rabbits was used by Kato and Murakami[1] in Nagoya (Japan) to study the mechanism of an increase of serum vitamin B_{12} levels. By their method of injecting a single dose of CCl_4, severe histological damage of the liver was produced which, however, was only temporary and recovery without permanent histopathological change was the rule. As a result of this injection, there was marked elevation in the serum vitamin B_{12} level which paralleled the development of acute hepatic necrosis, and a marked decrease in vitamin B_{12} storage in the liver. The increase in total serum vitamin B_{12} within 48 hours after administration of CCl_4 had a quantitative relationship to the decrease in vitamin B_{12} in the whole liver; this suggests strongly that the rise in serum vitamin B_{12} level is due to release of stored vitamin B_{12} following hepatocellular disintegration. Kato and Murakami determined the B_{12} level by paper electrophoresis and found that the bound vitamin B_{12} is mainly in the alpha globulin fraction whilst the free form is recovered mainly from the beta globulin fraction. In normal rabbit liver cells, more than half of the vitamin B_{12} is present in the mitochondria but in the damaged liver its content in the mitochondria is markedly decreased.

This and similar reports throw some doubt upon statements indicating that vitamin B_{12} protects rats from liver damage by CCl_4 intoxication, but they point to the possible value of vitamin B_{12} estimation in the diagnosis of liver disease. Rachmilewitz *et al.*[2] of Jerusalem have continued their investigations into this aspect of vitamin B_{12} determination in cases of severe congestive heart failure associated with hepatomegaly. They use a mutant of *Escherichia coli* to determine B_{12} microbiologically and report their findings in 28 patients. Whereas the serum B_{12} level in normal persons falls within the range of 200 micromicrograms to 500 micromicrograms per ml., these values in most patients ranged from 500 micromicrograms to 3500 micromicrograms per ml. In 11 patients the values were over 1000 micromicrograms per ml., and of five who had normal levels three had congestive failure of recent onset. It is of interest that in one patient whose vitamin B_{12} level in the serum shortly after admission to hospital was 3500 micromicrograms per ml., it fell to 920 after effective diuresis and decrease in the size of the liver. As against the temporary increase in serum vitamin

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B_{12} in acute liver damage of viral or chemical origin, heart failure with liver congestion causes continuation of a high level as in cases of malignant hepatic metastasis. Rachmilewitz *et al.* suggest the use of vitamin B_{12} determination as an index of the degree of hepatic damage which is more sensitive than commonly used liver function tests, including serum transaminase estimations. W. GROBIN

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THE SILENT SCOTSMAN*

When Lady Fleming asked André Maurois to write the official biography of her husband, the discoverer of penicillin, she did a public service and also a special service to medicine. Too often dreary, eulogistic, or simply overly long biographies of the great prevent us from learning by their experiences. Maurois, who started his career as a writer with that brilliant war book "The Silence of Colonel Bramble", is the happiest choice, a Frenchman who knows English and Scots from long, loving acquaintance and skilled observation. He is a practised historian and literary craftsman of the first order. But even these qualifications will not make a great biography unless its subject is worth writing about.

Many have supposed that Sir Alexander was one of those men of modest genius who stubbed his toe on a great discovery, who had greatness thrust upon him by the exertions of others. But Maurois will convince them that they are mistaken. Fleming was something very different, a modest man of genius. It seems that he himself derived a good deal of fun from the "Fleming myth" as he called it, and so he may have been responsible himself for a story told about him in the early 1950's. Apparently during one of the conferences regarding the development of penicillin in Britain, an argument developed and a small man got up and protested, "But after all it is my baby!" A voice at the back echoed, "And you left it out on Florey's doorstep and you should have been shot for it!" Maurois shows clearly that Fleming did no such thing. He understood perfectly the implications of the vagrant mould which had blown on to his culture plate in the little, cluttered laboratory in Paddington. He communicated his findings to learned societies with great clarity. He told his colleagues repeatedly that penicillin was much better than sulfonamides, which were the wonder drugs of the late 1930's. But somehow he could not get them to listen, or if they did listen, to take what he said seriously. Sir Henry Dale is very frank and helpful about this and he says, "I very well remember his interesting paper and the way in which we all of us said 'Charming, wasn't it?' Just the sort of naturalist's observation Fleming would make and that was all." And again another time, "Oh yes, we said. Fleming does observe that nice sort of thing"—He was very shy and excessively modest in his presentation, he gave it in a half-hearted sort of way, shrugging his shoulders as though he was deprecating the importance of what he said. At the same time the elegance and beauty of his observations made a great impression. It is possible that Sir Henry has seen the matter with a certain rosy retrospection, for no one asked any questions and the unlucky Fleming must have felt that he had cast his pearls before swine who had not even noticed them or him.

He made strenuous efforts to isolate the entire principle from *Penicillium notatum* on his own and constantly encouraged others to do so. But he had very small resources and was not very adroit at obtaining money, and his chief, the massive dogmatic Sir Almroth Wright, a great immunologist, did not believe in chemotherapy. Furthermore, the chemistry of penicillin proved to be difficult. Indeed, when Florey and Chain eventually solved the problem more than a decade later new chemical methods played a part. This does not in any way reduce Florey's wisdom in reopening the matter, Chain's great skill and the timeliness of the Rockefeller Foundation grant which allowed them to do the work.

Maurois has not explained Fleming's failure to get support as fully as one would have liked. He was respected, even admired, but for some mysterious reason not taken seriously, in spite of being a man whose ability was fully recognized by his peers. The mystery is important, for one wonders how often Flemings are neglected in this way.

Perhaps we can learn something by contrasting him with Sir Frederick Banting who was his junior by 10 years and who died about 14 years before him—50 years of their lives overlap. Banting made his great discovery in his early thirties and for the 20 years which remained to him he was honoured. He was one of the great amateurs. Fleming was the professional *par excellence*. Trained by and perhaps too long in the shadow of Almroth Wright, Fleming would have had a great scientific reputation had he died in 1929 when he made his discovery. He was not an amateur. He was an extremely competent technician and a master of improvisation. He had introduced Paul Ehrlich's Salvarsan, 606, the magic bullet, to Britain. He was one of those strange, reticent, visionary Scotsmen who had learned how to keep one eye peering down a microscope and the other on some improbably distant horizon. Such men have always been a puzzle to Englishmen. Looked at one way, Fleming was a dry, commonsense, prosaic, almost pawky Scot—yet inside was lurking someone very different but nearly inarticulate. Sometimes that romantic watcher from the wings almost broke loose, and the discovery of penicillin was one of those rare occasions. Luckily it happened once again towards the end of his life when he made a second marriage, to a Greek lady. It was she who had the good sense and fine taste to place his papers in the hands of André Maurois. This is perhaps *the* biography of a professional medical researcher. Fleming, whether he recognized it or not, is clearly what C. P. Snow would call one of "the new men", a moulder of our

*The Life of Sir Alexander Fleming, by André Maurois. Translated from the French by Gerard Hopkins. 293 pp. Illust. Jonathan Cape, London; Clarke, Irwin & Company Limited, Toronto, 1959. $5.50.

age. What sort of people are these great laboratory men? Should we fear them or welcome them?

Banting is a far better known type in both fact and fiction, one of the conquistadors of science. Fleming—almost a proconsular figure—is practically alone. He is indeed one of the first full-time professional medical scientists to have become an immortal. Fleming spent nearly all his professional life as a lab man. He started in a laboratory and died while still working there. He is notably different from Banting, who forced his way in. Perhaps Maurois might be persuaded to attempt Sir Frederick Banting's biography. Many of those unpublished papers would doubtless illuminate this stormy personality.

A more ebullient man might have launched penicillin a decade earlier. Banting probably would have done just that had penicillin come into his ken. Yet a less able craftsman, a less acute observer, would never have given the plate spoiled by mould a second thought. Fleming's mind was perfectly attuned to what he saw.

In his closing years after the great triumph everyone wanted to honour him, except of course Sir Almroth Wright who could not forgive his favourite pupil for disproving or at least gravely harming his favourite notion. Wright's almost religious conviction was that the body could cope with every bacteriological insult from its own armoury of immunities. It was all a little sad.

Then to show this paladin of lone researchers how much they all loved him, he was made the director of his own institute. He seems to have loathed it. Unfortunately our thinking is still so crude that we do not really know how to honour great researchers except by trying to turn them into administrators, which they rarely are. But in his last months he ceased being a director, and was back in the beloved though much enlarged laboratory with his new young wife. He was, it seems, extremely happy.

This is a splendid book about a great medical scientist. No medical man should miss reading it. For students and all research workers it should be compulsory, and wholly obligatory for those committees who deliberate on research funds. Like Banting, Fleming did his finest work under what seem to have been very unfavourable conditions. Indeed, perhaps in a less muddled, less overcrowded and less really used laboratory *Penicillium notatum* would have never reached the staphylococcal plate—for none would have been left lying around. Fleming lived in a state of ordered confusion which he shares with many great scientists who are not clean desk men. Neither Banting nor Fleming seems to have worried very much about our modern Old Man of the Sea who is being clamped mercilessly on researchers—methodology. Children of a simpler age, they lacked some of our advantages yet benefited by this.

In a long and mostly obscure life, Fleming had many successes of which penicillin was the brilliant crown. Though a quiet, shy and reticent man, once people knew that his ideas were good they could recognize him for the man of genius and vision that he was. Before, he had seemed too modest and unassuming. But his greatest achievement was to show in the last years of his life that a quiet scientist who had lived much of his life in the laboratory could succeed at that most difficult task of being a success.

H. O.

LESIONS OF THE MIDDLE CEREBRAL ARTERY

During the era of classical clinical neurology, of all cerebrovascular lesions those of the middle cerebral artery were the most extensively studied and recognized in clinical practice. This is quite understandable, since the middle cerebral artery is the one of greatest importance as regards the principal functions of the brain, and its lesions produce the most impressive clinical pictures in neurology. Clinical syndromes have been gradually established in connection with lesions of the individual branches of the middle cerebral artery, but it was not until cerebral angiography became an integral part of clinical neurology rather than an auxiliary method that the clinical pictures could be correlated with their underlying pathology, and new syndromes established. Recognition of these syndromes has become increasingly important in view of the great advances in neurosurgery and drug therapy (such as anticoagulant therapy).

In their analysis of 36 cases of occlusion of the middle cerebral artery with angiographic studies, Jacobsen and Skinhoj (*Danish M. Bull.*, 6: 9, 1959) list the symptoms and signs arising from lesions of the temporal and parietal lobes of the ipsilateral side. In cases of complete occlusion, they found massive hemiplegia, severe mental disturbances, and aphasia if the lesion affected the dominant hemisphere. Hemianopia was present in a few cases, while pupillary signs and paralysis of the eye muscles were absent. In cases of partial occlusion the clinical picture was less characteristic. Electroencephalographic studies failed to reveal irritative phenomena. Signs from the contralateral hemisphere were absent. Occlusion of the middle cerebral artery cannot be distinguished from occlusion of the internal carotid artery solely on clinical and electroencephalographic grounds, even though its clinical picture is more typical and its onset more definitely apoplectiform.

In an attempt to establish syndromes caused by aneurysms of the middle cerebral artery, Hook and Norlen (*Acta chir. scandinav.*, Supplement No. 235, 1958) report on 80 thoroughly investigated cases. Among symptoms, headache, frequently of long duration, was found in one-third of cases. The onset in the majority of cases was with acute loss of consciousness. Hemiplegia, frequently with facial paresis of the central type, also occurred in the majority of cases. Aphasia, epileptic seizures, visual hallucinations and endocrine disturbances were found in a small number of cases. From their experience the authors draw the conclusion that operation is indicated as soon as the patient has recovered from the immediate consequences of the hæmorrhage. The number of patients who made a full recovery after operation is quite impressive, considering the fact that the age of onset in this series was between 30 and 50.

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Medical News in brief

RESISTANT URINARY INFECTIONS WITH AEROBACTER AEROGENES

A study by Lattimer *et al.* (*J. A. M. A.*, 170: 938, 1959) supports the view that *Aerobacter aerogenes* infections are increasing in frequency, especially in patients who have chronic urinary infections. Study of 20 strains of *A. aerogenes* and eight strains of *B. coli* shows that on re-culture none of the strains of the latter micro-organisms became more resistant to antibiotics, whilst it was possible to induce artificially resistance to tetracycline in all strains of *A. aerogenes*. Septicæmia due to resistant organisms is much more lethal and is a very real problem in patients with urinary infection who are undergoing surgical procedures.

Kanamycin, chloramphenicol, novobiocin, sulfadiazine, penicillin, streptomycin, nitrofurantoin, erythromycin and oleandomycin were all tested for susceptibility against *A. aerogenes*, and the development of cross-resistance was somewhat alarming. It may be necessary to find an entirely new approach to the problem of drug resistance.

TREATMENT OF HYPERTHYROIDISM WITH RADIOACTIVE IODINE^{131}

Of 200 patients observed for a minimum of one year after treatment with radioactive iodine for hyperthyroidism, Cassidy and Astwood of Boston (*New England J. Med.*, 261: 53, 1959) found that 85.5% experienced a return to normal. In the remaining 14.5%, permanent myxœdema developed. Eighty-nine per cent were cured of their disease after one or two treatments whilst the remainder required three to seven treatments. None of these 200 patients had thyroiditis, acute exacerbation of hyperthyroidism, or a recurrence of the disease after the remission. When studying the factors which may possibly be related to the varied response as regards remission on the one hand and the occurrence of myxœdema on the other, the authors found that neither the size of the gland nor the size of the dose as related to the size of the gland seemed to have any influence on these two undesirable features. Adjuvant treatment with antithyroid drugs soon after administration of radioactive iodine did not produce a significant difference in the incidence of recurrence, but the patients so treated were much less prone to develop myxœdema.

Radioactive therapy is superior to surgical treatment because it causes no mortality, no vocal-cord paralysis and no tetany. The recurrence rate is negligible, and completely refractory cases have not been encountered. On the other hand, the high prevalence of myxœdema and not infrequent need for repeated treatments are drawbacks of this form of therapy. Generally speaking, radioiodine is indicated in older patients, especially those with cardiac complications, in those with large thyroid glands, and in those who have relapsed after other forms of treatment. In childhood and during pregnancy, antithyroid drug therapy is preferable.

SWEAT ELECTROLYTE VALUES IN CYSTIC FIBROSIS

Of all the tests used for cystic fibrosis (mucoviscidosis, fibrocystic disease of the pancreas) the estimation of chloride and sodium concentration in the sweat has proved most reliable and has been found increased in more than 99% of cases. In a study by Peterson (*J. A. M. A.*, 171: 1, 1959) which reports 313 sweat tests performed on 262 persons, none of the normal subjects or patients with diseases dissimilar to cystic fibrosis had sweat electrolyte values above normal. All the patients with cystic fibrosis had elevated electrolyte values, as did some patients with cylindrical bronchiectasis and a few of those with chronic bronchitis.

From these findings it would appear that a relationship exists between endobronchial disease such as cylindrical bronchiectasis and fibrocystic lung disease. The author believes that mild incomplete cystic fibrosis in adults may pass unrecognized. He also expects involvement of several exocrine organs, such as the acid glands of the stomach, the salivary glands, liver, pancreas, Brunner's glands and others in one or the other case. A plea is made for applying the sweat test to adults with endobronchial disease.

DIAGNOSIS OF CAROTID ARTERY OCCLUSION

The notorious difficulty of diagnosing occlusive disease of the carotid arteries prompted Hass and Goldensohn (Neurological Institute of New York) to review the charts of 35 patients with confirmed carotid artery occlusion for diagnostic features which might be of general usefulness. At least one electroencephalogram and arteriogram were available in 31 cases; in two there were records of post-mortem examinations and in one an operation record. Although the results of electroencephalographic studies are not very specific, there is a tendency for the abnormalities in the tracings to parallel the severity of symptoms. The effect of postural tilting on the records of seven patients in this group was studied; except for some mild slowing of the abnormal record in one patient, no new changes were observed. Contrary to the previously reported opinion that electroencephalographic abnormalities in cerebro-vascular disease due to carotid occlusion disappear comparatively rapidly, many of the patients reported here exhibited persistent abnormalities.

Unilateral carotid disease was found to be more frequent in men and its onset was largely in the fourth to sixth decades. Progression of symptoms was episodic and there was a marked tendency for the opposite upper limb to be the site of the initial motor and sensory symptoms. The optic radiation was rarely involved, and headache and high blood pressure were infrequent. Almost all patients had palpable carotid pulses. Seizures at the onset of or as a sequel to infarction were also infrequent. These diagnostic features may be helpful in distinguishing carotid artery occlusion from intracerebral space-occupying lesions which they so often resemble clinically.—*Neurology*, 9: 575, 1959.

(Continued on advertising page 49)

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REVIEW ARTICLE

THE RESULTS OF EARLY DIAGNOSIS OF GENITO-URINARY CANCER: CONTEMPORARY TRENDS IN DIAGNOSIS AND TREATMENT*

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GENERAL CONSIDERATIONS

THE EARLY recognition of genito-urinary cancer, followed by modern treatment[1] is rewarded by gratifyingly high cure rates. Most can be diagnosed by methods available to physicians other than urologists. Bizarre cases are rare. Specialized techniques are not essential for the diagnosis of many tumours and are seldom necessary to establish sufficient suspicion for specific urological tests to be undertaken.[2]

Symptom complexes peculiar to these tumours in their early, potentially curable stages permit their classification into four groups: prostatic cancer, adrenal neoplasms, cancer of the urinary organs, and cancer of the external genital organs. In each class of cancer a thoughtfully taken history, careful inspection, and thorough palpation are the foundations of diagnosis. Beyond this, with a few exceptions, the lesion can usually be identified by methods available generally to physicians.

PROSTATIC CANCER

Curable Phase of Prostatic Cancer

Prostatic cancer, in its curable phase, exists as a nodule within the anatomical limits of the gland and occurs with significant frequency in men over 50 years of age.[3] The characteristic lesion, a hard nodule in the posterior lamella of the gland, seldom causes symptoms. Early prostatic cancer, however, may almost always be detected by rectal palpation (Fig. 1). Operative removal of the localized lesion in its pre-symptomatic stage, by radical prostato-vesiculectomy, yields a 10-year survival rate of 49% compared with a statistical life expectancy for men of comparable ages of 53%.[4-6] The importance of routine rectal examinations in men over 50 is illustrated by U.S. Army experience, in which the procedure was encouraged by administrative regulations. Sixty per cent of patients reported on by Kimbrough[7] at the U.S. Army Walter Reed Medical Center had

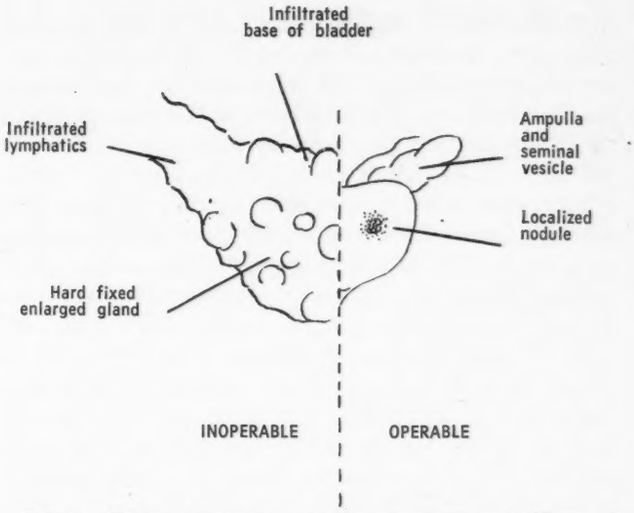

Fig. 1.—Diagram of rectal findings in early and advanced prostatic cancer.

operable lesions, compared with 5% in the writer's experience.

Radical prostato-vesiculectomy performed by a perineal approach carries a mortality rate ranging from 0 to 3.9% in large series which have been reported.[4-6] Comparable results may be expected when a retropubic incision[8] is employed. Either operation will occasionally result in urinary incontinence, which most patients are willing to accept as the price for cure of cancer. Occasionally vesico-urethral strictures result.

Rectal palpation followed by surgical exposure and biopsy or excision of the suspected lesion is the best means to diagnose operable prostatic cancer.[9] Cytological examination of expressed secretion is of unproved value and can be criticized on the ground that massage of the gland may spread cancer. The serum acid phosphatase is commonly increased in advanced prostatic cancer but not so when the lesion is amenable to cure. Needle or trans-rectal biopsy of suspicious lesions is not only undependable but can spread malignant cells outside a potentially curable local lesion.[10]

Prostatic cancer may be found in supposedly benign adenomatous tissue[11] removed for obstruction and it may develop after successful enucleation or resection of a benign lesion.[12] A plain x-ray examination of the abdomen in every case of suspected prostatic cancer should be made for metastatic lesions and to find prostatic calculi, which may occasionally be mistaken for malignant nodules. Microscopic examination of prostatic secretion for pus will aid in distinguishing inflammatory from neoplastic prostatic indurations.

Palliation of Prostatic Cancer

If prostatic cancer brings itself to the patient's attention by producing slow micturition or urinary retention, by causing backache or sciatic pain as the result of bony metastases,[13] or by causing anæmia or cachexia, its recognition by rectal palpation should be easy. The lesion is seldom

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operable at this stage. The gland is firm to hard, frequently nodular, and usually fixed to the adjacent bony pelvis, and extensions of malignancy to the base of the bladder or to the regional lymphatics along the seminal vesicles may be felt rectally. Bone metastases, nearly always osteoblastic, are seen in roentgenograms. Serum acid phosphatase is elevated in 66% of patients with metastases,[14] or in a larger proportion if the newer tartrate-inhibited enzyme reactions are employed.[15, 16] Huggins, Scott and Hodges[17] showed that in most of these patients, striking arrest of cancer growth and relief of symptoms will follow castration or administration of œstrogens. Primary and metastatic lesions shrink; anæmia and cachexia subside. Seventy-one per cent of cases respond favourably.[18] Satisfactory palliation is rare in men under 50.[7] A combination of castration and œstrogen administration results in a 44% five-year survival rate with reduction by about 15% if one method or the other is used alone.[18] Side effects of œstrogen therapy in therapeutically effective doses include gynæcomastia and ankle œdema. There is no general agreement as to an ideal œstrogenic substance or dosage. The author finds 5 mg. daily of stilbœstrol inexpensive and satisfactory for most patients. Occasional patients in whom conventional dosage ranges become ineffective with passage of time are benefited by massive doses.

Reactivation of prostatic cancer arrested by castration and œstrogen therapy occurs eventually in most patients. The work of Scott,[19] Harrison[20] and others has shown that this is probably due to residual androgen production by the adrenal glands. This may be suppressed by administration of adrenal corticoid hormones and in many patients recurrent pain from bony metastases may be relieved for months or years.[21] Dose is titrated against symptoms. Twenty-five mg. of cortisone twice a day or an equivalent dose of synthetic hormone is often adequate. In the event that localized bone pain again develops which is refractory to corticoids, x-ray treatment with conventional equipment in doses titrated to the patient's symptoms may produce striking palliation and can be repeated if necessary. In some patients it may prove best to use local x-ray treatment before a trial of corticoids.

Recurring obstruction due to prostatic cancer is best treated by transurethral resection. Local injection of radioactive gold in prostatic cancer has yielded promising results in Flocks's clinic.[22]

While bilateral adrenalectomy does not appear to be superior to administration of corticoids alone, hypophysectomy has been used in several clinics and merits further trial.[23]

ADRENAL NEOPLASMS

The symptomatic manifestations of adrenal neoplasms are usually due to cortical or medullary hormone production.[24] Exceptions occur, notably neuroblastoma in childhood and rarer non-endocrine tumours during adult life.

Phæochromocytoma of the adrenal medulla is suspected in cases of hypertension, especially when it is intermittent or precipitated by mechanical disturbance of the tumour. Measurement of urinary excretion of catecholamines and the specific hypotensive effect of Regitine (phentolamine) appear to be the most satisfactory diagnostic tests now available. Plain radiography of the abdomen or excretory urography may locate the adrenal tumour. If necessary, laminography or presacral retroperitoneal pneumography[25] can be employed. Carbon dioxide is the safest medium for retroperitoneal pneumography.[26, 27]

Treatment of adrenal tumours, which may be benign or malignant and are more often the former, is by surgical excision with due precaution against hypertension during manipulation of the tumour and against hypotension after its removal.

Adrenal cortical hyperplasia and cortical tumours are manifested in childhood by intersex and adrenogenital syndromes[28] and in older subjects by Cushing's syndrome. Radiographic studies similar to those for medullary tumours are required although final localization of disease may depend upon surgical exploration. In juvenile intersexual cases due to adrenal hyperplasia, cortisone administration restores endocrine balance. Adrenal cortical tumours in older patients require surgical removal. Cushing's syndrome due to bilateral adrenal hyperplasia appears currently to be best treated by total adrenalectomy followed by substitution therapy.

URINARY TRACT CANCER

Blood in the urine is the cardinal sign of urinary tract cancer. It may be gross or microscopic. Commonly, it is spontaneously remittent, only to recur when the lesion has advanced beyond the point of cure. Physicians may mistake urinary bleeding due to cancer for a sign of infection and on account of the disappearance of bleeding while treating for infection fail to make a diagnosis of cancer until too late.

Hæmaturia always demands an explanation. Careful questioning will often indicate whether or not it originates from the urethra or prostate or from the kidneys, ureters or bladder.

In addition to producing hæmaturia,[29] cancer can mimic symptoms of urinary infection. Intractable urinary infection almost always results from either cancer, stones, tuberculosis or obstruction.

If inspection and palpation, including rectal palpation, do not readily explain the disorder, intravenous pyelography is the next step. Contraindicated in asthmatics, individuals with iodine sensitivity, and patients with severe renal failure, this examination has, with new and more accurate

media,[30, 31] a mortality rate which is probably less than 1 per 120,000 examinations.[32] Non-fatal reactions occur occasionally. It is unwise to perform the examination unless equipment for emergency resuscitation[30, 32] is at hand. Opinion is divided on the merit of ophthalmic or intradermal sensitivity tests with contrast medium, but it is apparent that negative test results do not preclude serious reactions.

Cancer of the Kidney

Intravenous pyelograms will show most renal tumours except when the kidney is non-functioning. Under such conditions retrograde pyelography is in order. Although benign solid tumours of the kidney are rare, solitary serous cysts of the kidney pose a difficult problem in differential diagnosis of renal masses. Pyelograms do not permit dependably accurate differentiation and neither do aortograms.[33] Aortograms, moreover, are occasionally the cause of paraplegia, renal shutdown, and death by other mechanisms.[34, 35] Because cysts not infrequently cause pressure symptoms; occasionally contain tumours; may rupture and bleed; and have no sure means of diagnosis available, surgical exploration of renal masses is almost always required. Only in patients who represent extremely poor operative risks does needle aspiration of renal masses seem justifiable.[33]

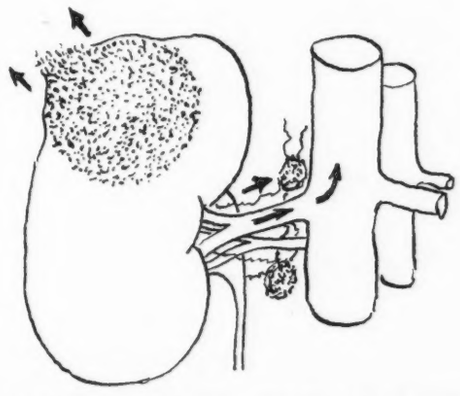

Fig. 2.—Renal cancer may invade adjacent structures directly, spread through lymphatic channels, or metastasize in the venous circulation.

Operation for removal of kidney cancer should be planned to permit early interruption of lymphatic and venous pathways from the tumour to general circulation, to allow wide resection of tumour within its fascial coverings, and to provide sufficient exposure for resection of adjacent vascular and lymphatic structures as well as of abdominal viscera if they are involved in tumour (Fig. 2). Several rib-resecting and abdominothoracic approaches which have evolved during the past two decades have been shown to be suitable for these objectives.[36, 41]

The importance of early diagnosis of kidney tumours is shown by the high survival rates achieved when conventional surgical incisions are used. For patients without involvement of the renal vein a rate of 50% at five years is expected; if renal vein invasion is found in the specimen, about 30% live five years.[42, 45] Higher salvage rates may be expected with the use of newer incisions since it has been shown that cancers inoperable by other methods may be removed through the more radical incisions.[41] Moreover, a patient with a solitary pulmonary or cerebral metastasis should not be abandoned, since surgical resection of these has yielded occasional long-term survivals.

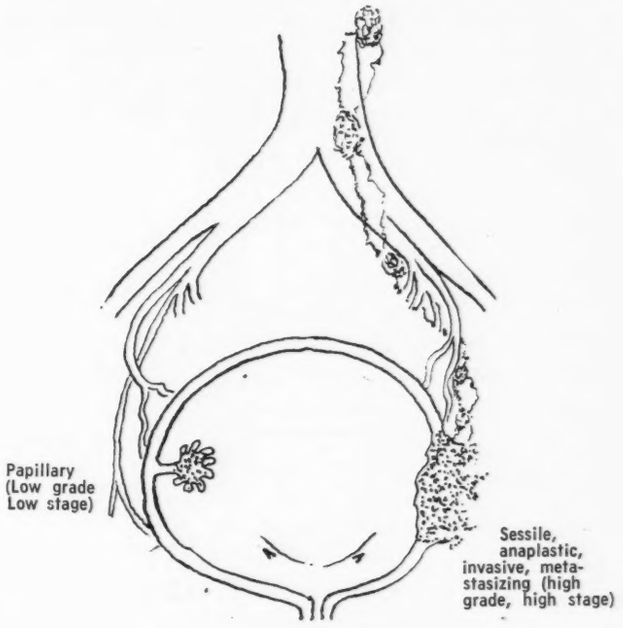

Fig. 3.—Types of bladder cancer.

About 75% of kidney cancers in adults are derived from renal tubular epithelium (hypernephroma, Grawitz or clear cell cancer). In addition to hæmaturia, a mass in the flank, and pain, about 10% of patients with these lesions exhibit otherwise unexplained fever as a chief complaint and about 10% unexplained anæmia. In patients without manifest explanation for these signs, intravenous pyelograms may give the diagnosis. Neither fever nor anæmia indicates incurability by surgery.[46]

About 15% of renal cancers are of transitional or squamous cell origin, derived from the lining of the calices or pelvis.[47] Biologically they resemble tumours of the ureter[48] and of the urinary bladder. The prime symptom is hæmaturia. Treatment is surgical.

The characteristic renal tumour of infancy and childhood,[49] of somewhat variegated histology, is the Wilms tumour. One of the commonest tumours of childhood, it is usually discovered as an abdominal mass. To some degree radiosensitive, the tumour may shrink if irradiated before surgery.[50] The best reported results, however, are from the Children's Medical Center[51] in Boston where 47% of patients survived primary excision followed immediately by radiation therapy.

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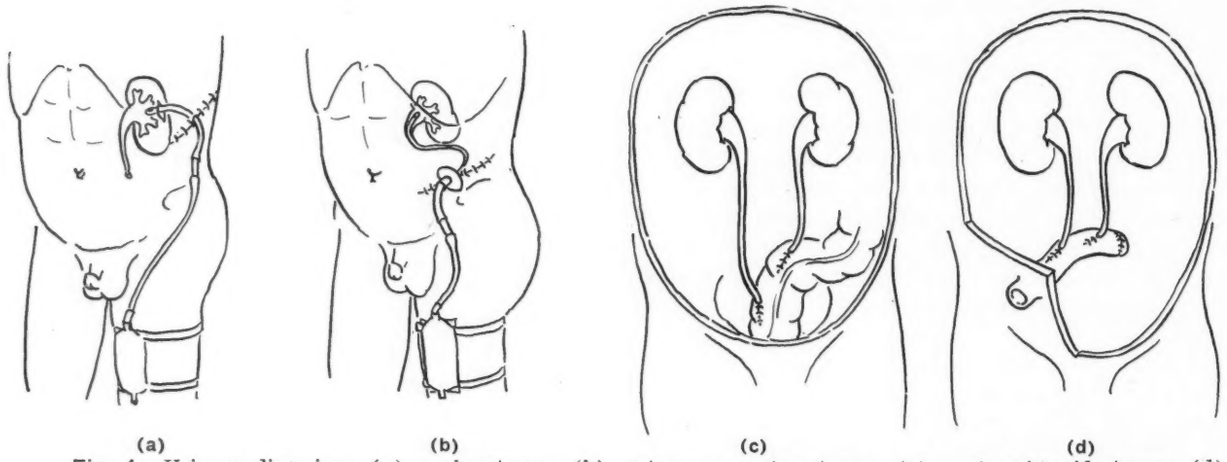
Cancer of the Urinary Bladder

If urography fails to disclose a renal tumour as cause for hæmaturia, a bladder tumour must be suspected and cystoscopy and urethroscopy performed to complete the search for cancer. Cytological preparations by Papanicolaou's method have yielded undependable results in urinary neoplasms.[52] Pyelography, cystoscopy and biopsy are necessary for diagnosis.

The results of treatment of bladder cancer depend, as Marshall and his associates[53] and Wallace and his colleagues[54] have shown, more upon the characteristics of the tumour itself than upon what is done to treat it. Benign bladder tumours are exceedingly rare. Nearly all tumours of the bladder are derived from its epithelial lining and are malignant.[53-55]



(a) (b) (c) (d)

Fig. 4.—Urinary diversion: (a) nephrostomy; (b) cutaneous ureterostomy; (c) ureterosigmoidostomy; (d) uretero-ileostomy.

The less anaplastic bladder tumours are usually papillary and stalked, and tend to be non-invasive and to metastasize late. Local excision, by cystoscopy or transvesical methods, yields survival rates at five years as high as 90% of normal expectancy.[53, 56] The prospect of multicentric recurrence of such neoplasms is high. Regular postoperative cystoscopic observation is necessary for satisfactory control of recurrences.

The less well differentiated tumours are sessile or ulcerative, invasive, and prone to metastasize locally and through regional lymphatics[53, 54, 57] (Fig. 3). For high-grade, high-stage tumours of this type, which sometimes consist of epidermoid or of mixed epidermoid and transitional elements, cure rates of 20 to 30% can be expected when they are situated in the dome of the bladder and susceptible to removal by partial cystectomy. Similar lesions near the base of the bladder require total cystectomy on account of propinquity of ureters and sphincter and yield no better than 20% five-year survival rates even when cystectomy is accompanied by pelvic lymph node dissection.[53, 54, 58] Cystectomy requires urinary diversion by cutaneous ureterostomy, ureterosigmoidostomy, ureteroileostomy with urinary ileostomy, or variants of the manœuvres (Fig. 4). The indications and merits of various methods of urinary diversion have been considered in recent reviews.[59-63] None is free of immediate or late complications. When bowel is used for urinary diversion, electrolyte reabsorption from intestinal surfaces can become a problem.[64, 65] Any form of urinary diversion presents potential hazards of renal damage from pyelonephritis.

The place of radiation in treatment of bladder cancer remains unclear. Radon seed implantation is, in certain situations, a valuable supplement to local excision.[66] Radiocobalt, supervoltage x-ray,[67] intracavitary irradiation and other techniques are currently undergoing evaluation in a number of centres. Among the higher-grade, higher-stage cancers radiation may have palliative value but evidence is not yet at hand that cure rates surpass those obtainable by surgery.

CANCER OF THE EXTERNAL GENITALIA

Cancer of Penis, Scrotum, Vulva and Urethra

Cancers of the penis,[68] scrotum, and of the male[69] and female urethra[70] are similar in symptoms, biological behaviour and treatment. Any genital lesion not unmistakably of genito-infectious origin must be considered malignant until proven otherwise by biopsy. Patients with urethral strictures or periurethral masses, not clearly of benign origin, must be suspected of having urethral cancers (Fig. 5). Most external genital cancers are of epidermoid type and metastasize by way of lymph nodes at the base of penis, inguino-femoral nodes, and the external and internal iliac lymphatic systems.

Properly designed radical excision[71-75] in one or more stages is the treatment of choice in all, and will yield five-year survival rates in the vicinity of 50% regardless of the organ involved or the sex of the subject. A recent study by Tupper[75] shows that patients tend to procrastinate in seeking medical advice for these lesions and doctors to procras-

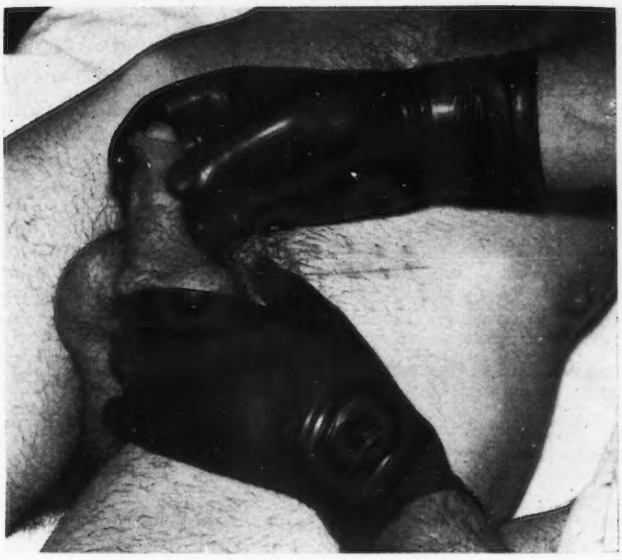


Fig. 5.—Palpation of urethra. (From Clarke and Del Guercio, *Urology*, courtesy McGraw-Hill Book Co.)

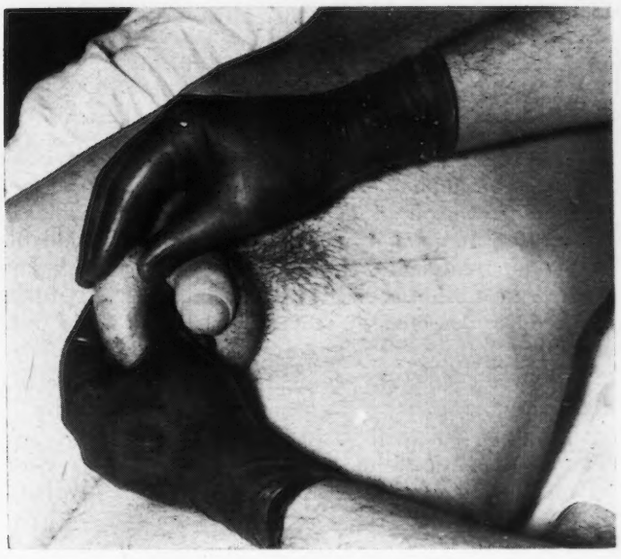


Fig. 6.—Bimanual palpation of separate scrotal organs. (From Clarke and Del Guercio, *Urology*, courtesy McGraw-Hill Book Co.)

tinate, without good reason, in establishing the diagnosis by biopsy.

Cancer of the Testis

Any patient with a scrotal mass not of unmistakably benign character must be suspected of having a testicular tumour. Delayed diagnosis in testis cancer is particularly tragic since the maximum incidence is among men in their twenties and thirties. Tumours of epididymis and vas are rare.[76] Nearly all testis tumours are malignant, derived from germinal cells.[77-79] They occur with 20 or more times expected frequency in ectopic testes, whether or not orchidopexy has been performed.[80]

The chief symptom is a scrotal swelling. This is painful in no more than 40% of cases. Circulating chorionic gonadotrophins and sometimes clinically perceptible gynæcomastia occasionally may occur in patients with testis cancer. Among painful scrotal swellings, differentiation from torsion of the testis or from incarcerated hernia is not a problem, since immediate surgery is indicated in any case. Testis tumour is occasionally found with hydrocele. If doubt exists, the transilluminable cystic hydrocele may be collapsed by aseptic aspiration and its contents accurately felt. Testis cancers have been mistaken for gummata, tuberculosis, and chronic epididymitis. Careful separate palpation of the scrotal organs will usually make the diagnosis (Fig. 6). If the diagnosis remains in doubt, surgery is indicated. A biologically acceptable operation is to expose the spermatic cord high in the scrotum, temporarily occlude its vessels and lymphatics with a suitable clamp, and view the scrotal contents through the opened tunica vaginalis. If suspicion of cancer remains, excision of testis, epididymis, and spermatic cord up to the internal inguinal ring is carried out.

If study of permanent histological sections confirms the diagnosis of cancer, radical orchidectomy is performed. The testicular lymphatics parallel to the spermatic vessels and great vessels are removed as high upward as the diaphragm. Extraperitoneal intercosto-inguinal[81] or thoraco-abdominal[82, 83] approaches yield satisfactory unilateral exposure and exceedingly low operative mortality rates. If positive nodes occur on the affected side, a contralateral radical operation is indicated. Positive lymph nodes may be expected to occur on the opposite side in about one out of five cases if they have been found on the affected side.[84] Currently under study at the U.S. Army Walter Reed Medical Center[84] is a technique for bilateral one-stage lymphadenectomy utilizing an abdominal incision similar to that employed for aortic grafts. All patients in whom positive lymph nodes are found require a full course of irradiation. Supervoltage techniques show promise in this disease. It may be proper, in some cases, to defer x-ray treatment in individuals who lack operative evidence of lymphatic involvement by cancer.

TABLE I.—PER CENT FIVE-YEAR SURVIVAL, CARCINOMA OF TESTIS

	Orchiectomy and radiation (127 cases)	*Orchiectomy, lymphadenectomy and radiation (243 cases)*
Seminoma	86	96
Other types	15	67

About 40% of testis cancers appear as radiosensitive seminoma. The rest take the form of relatively radio-resistant teratocarcinoma, embryonal carcinoma, or choriocarcinoma. Eleven per cent of seminomas metastasize as one of the radioresistant tumours.[85] That early diagnosis, radical surgery, and judicious irradiation of testis cancer will give remarkably good five-year survival rates[86] is shown by experience at Walter Reed U.S. Army

Hospital, reported on by Patton and Mallis[87] (Table I).

SUMMARY

When the presence of hæmaturia, intractable urinary infection, or tumour of abdominal or genital structures leads to suspicion of genito-urinary cancer, high salvage rates may be expected with presently available means of treatment. The same consideration applies to early localized cancer of the prostate in its asymptomatic form, detected by rectal palpation of males over age 50.

The best results are obtainable when the physician's diagnostic suspicion is promptly confirmed by a thoughtfully obtained history, careful inspection and accurate palpation and when the diagnosis is proven by radiography, by endoscopy, or by prompt surgical biopsy or exploration.

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RÉSUMÉ

Le cancer de la prostate se manifeste au toucher rectal par un nodule perçu dans les limites anatomiques de la glande. Lorsque pratiquée au stage présymptomatique, l'intervention procure une survie de 10 ans à 49% des malades, qui se rapproche beaucoup de l'espérance normale de vie de 53% pour les hommes d'âge comparable. La phosphatase acide n'est pas nécessairement élevée au début. Le diagnostic différentiel comprend les calculs de la prostate et la prostatite. Les principales interventions dans ces cas sont les prostato-vésiculectomies radicales par voie périnéale ou rétropubienne. Dans les cas avancés les mesures palliatives comprennent la castration et l'administration d'estrogènes; elles produisent une survie de cinq ans dans 44% des cas. La réactivation se produit tôt ou tard dans la plupart des cas et dépend probablement de la sécretion d'androgènes par les surrénales. Une thérapie à base d'hormones cortico-surrénaliennes apporte souvent un soulagement notable. L'obstruction est surmontée par la résection transurétrale.

Parmi les tumeurs des surrénales les phéochromocytomes sont reconnus comme cause d'hypertension. L'épreuve à la phentolamine sert à leur dépistage. L'hyperplasie et les tumeurs du cortex se manifestent dans l'enfance par la production d'états intersexuels et de syndrome adrénogénital alors que chez les adultes on observe le syndrome de Cushing. Dans les cas d'hyperplasie chez les jeunes l'administration de cortisone peut rétablir l'équilibre endocrinien mais dans les cas de tumeurs l'excision s'impose.

Les cancers des voies urinaires produisent toujours de l'hématurie. La source de cette hématurie peut quelquefois être établie simplement à l'interrogatoire. On doit cependant souvent recourir à la pyélographie endoveineuse pour en préciser l'origine. Si le rein de ce côté n'a pas cessé de fonctionner, la tumeur sera fréquemment mise en évidence par cette épreuve. Les kystes du rein peuvent donner la même image radiologique, si bien qu'en face d'une masse rénale le chirurgien se doit presque toujours d'intervenir. Si les veines rénales ne sont pas prises l'opération donne

une survie de cinq ans dans 50% des cas; lorsque les veines sont envahies ce chiffre tombe à 30%. Environ 75% des cancers rénaux chez les adultes viennent de l'épithélium tubulaire. Entre autres symptômes cette tumeur cause de l'anémie et de la fièvre. Le meilleur traitement des tumeurs de Wilms chez les enfants semble être la résection suivie immédiatement de radiothérapie.

Les tumeurs bénignes de la vessie sont extrêmement rares. Les papillomes au début ne montrent pas de tendance à l'envahissement et leur excision locale donne un taux de survie de cinq ans d'environ 90% de l'espérance normale de vie. On ne peut malheureusement en dire autant des tumeurs sessiles. La cystectomie exige le détournement des uretères soit à la surface de l'abdomen soit au sigmoïde. Aucune de ces méthodes n'est affranchie de complications immédiates ou lointaines.

Toute lésion des organes génitaux externes, tant chez l'homme que chez la femme, à qui on ne peut attribuer une origine infectieuse doit être considérée comme néoplastique jusqu'à preuve du contraire. Un des dangers que présentent ces lésions vient de la tergiversation du malade ou du médecin devant l'intervention. La grande majorité des tumeurs des testicules sont malignes et exigent une intervention immédiate; elles se manifestent par un gonflement souvent indolore du scrotum. Si les ganglions lymphatiques sont envahis la chirurgie doit être suivie de radiothérapie à haut voltage.

GENERAL PRACTICE

SCHOLARSHIPS AND BURSARIES FOR 1960

EIGHTEEN UPJOHN SCHOLARSHIPS will be available for the year 1960. They are of the value of $500 each. These scholarships will provide substantial assistance to those who are particularly interested in pursuing courses of study which may aid them with their general practices. The course must be of a minimum of two weeks' duration and may be obtained in any hospital of the doctor's choice in Canada or the United States. Six scholarships are allocated to Ontario, three to Quebec, two to British Columbia, and one to each of the remaining provinces.

Ten College of General Practice Bursaries (Schering Corporation Limited) of the value of $500 each are also available. These are allocated one to each province. They are to help defray expenses for attendance at concentrated two-week courses in three particular Canadian hospitals. These courses can be arranged at any time on application to the hospital by the award winner and will include daily ward rounds and attendance at conferences and at various clinics of the medical or surgical specialties.

The participant may select in advance various things which he would like to do during his stay at the hospital. For example, if he wishes to spend the whole time in cardiology, this may be arranged. One of the staff men of the hospital will be assigned to supervise the course and to meet with the participant from time to time to discuss any problems. The recipient will pay $100 out of the $500 award to the hospital and retain the balance to help cover his other expenses. The three hospitals in which this individual intensive course is available are: Montreal General Hospital—Dr. R. Roy Forsey, Chairman, Postgraduate Board; l'Hôpital St-Luc, Montreal—Dr. Roméo Boucher, Chief of Medical Services; University Hospital, Saskatoon—Dr. Allan A. Bailey, Secretary of the faculty in charge of arrangements.

Both scholarships and bursaries are open to all associate and active members of the College of General Practice of Canada. Further information including application forms may be obtained at the College office, 176 St. George Street, Toronto 5, Ontario. Applications are mailed to the Provincial Secretaries and must be in their hands by January 1, 1960. The awards will be made after this date by the Provincial Awards Committee of each province.

The Provincial Secretaries are:

British Columbia—Dr. V. W. Smith, 1029 Douglas St., Victoria.

Alberta—Dr. N. L. Smith, 220-6th Ave. E., Calgary.

Saskatchewan—Dr. T. O. Ramsay, Dodsland.

Manitoba—Dr. I. Schwartz, 606 Boyd Bldg., Winnipeg.

Ontario—Dr. H. H. Hetherington, 22 John St., Brampton.

Québec—Dr N. P. DaSylva, 3244 est, rue Beaubien, Montréal.

New Brunswick—Dr. L. I. Morgan, 5 Lansdowne Ave., Saint John.

Nova Scotia—Dr. J. A. MacDonald, Bay Medical Group, Glace Bay.

Prince Edward Island—Dr. H. W. Moyse, 5 Central St., Summerside.

Newfoundland—Dr. H. J. Warrick, 15 Church Hill, St. John's.

SASKATCHEWAN CHAPTER OF THE COLLEGE OF GENERAL PRACTICE

AT THE recent annual meeting of the Saskatchewan Chapter of the College of General Practice the following officers were elected for the year 1960: president, Dr. C. W. James, Kerrobert; vice-president, Dr. W. E. H. Alport, Regina; secretary, Dr. T. O. Ramsay, Dodsland; treasurer, Dr. L. U. Penner, Kindersley; member of the Board of Representatives, Dr. A. J. Wasylenki, Regina.

FOURTH SCIENTIFIC ASSEMBLY

THE Fourth Annual Scientific Assembly of the College of General Practice will be held in the Queen Elizabeth Hotel, Montreal, from February 29 to March 3, 1960. An outline of the program will be published in the December 15 issue.

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Association Notes

INSTALLATION OF PRINCE PHILIP AS B.M.A. PRESIDENT

Four months after his installation as President of the Canadian Medical Association in Toronto, H.R.H. The Prince Philip, Duke of Edinburgh, was installed as President of the British Medical Association in the Great Hall of B.M.A. House on Wednesday afternoon, October 28. Sir Arthur Thomson, the retiring President of the B.M.A., was in the chair, and Dr. E. Kirk Lyon, C.M.A. Deputy to the President, and Dr. Murray Douglas, Chairman of Council of C.M.A., represented the Canadian Medical Association. In his opening remarks, the Chairman said that in 1832 when the British Medical Association was founded by Sir Charles Hastings, it was the founder's hope that a voluntary association of doctors could restore to medicine the unity and ideals of clinical work first defined by the school of Hippocrates. This was still the main purpose of the British Medical Association. Sir Arthur said that in accepting the office of President, Prince Philip had become "the chief medicine man not only for us here in Britain, but for doctors throughout the Commonwealth". Sir Arthur then invested Prince Philip with the Presidential badge, and the new President delivered his address.

Prince Philip began by expressing his great disappointment at not being able to be present in Edinburgh at the joint meeting of the British Medical Association and the Canadian Medical Association. He said that this left him with two presidential addresses, which was exactly like having mumps twice with all the risks of the possible complications. He reported that his installation as President of the C.M.A. in Toronto was a great occasion, and despite the things he had said in his address no one had thrown anything at him. He expected the same considerate treatment in London. In all honesty, he had never expected in his wildest dreams that he would be President of the British Medical Association. He said "for a layman and an occasional patient to find himself in this exalted position is rather like a poacher finding himself guest of honour at a gamekeepers' reunion. The sensation is pleasant enough but there is a distinct feeling that one must tread with caution."

Prince Philip thought that even in this modern age there was still a suspicion that doctors had some sort of special power, which was probably quite a good thing in the purely medical sense, though when applied to the B.M.A. this thinking might lead to wrong conclusions. He felt that the B.M.A. was one of those things which entirely justify our idea of freedom and democracy; freedom because the essence of freedom is self-control as opposed to some form of outside direction, and democracy because the people who exercise control are ordinary members of the profession. The B.M.A. had recognized from the start that the profession must be responsible for its own ethics, as well as being the watch-dog over the interests of its members. It was in no way dishonourable for the Association to be involved in violent arguments, so long as it always had the true interests of the medical service of the country at heart. In any case, the democratic process was not expected to produce the right answer but only an answer acceptable to most people.

Prince Philip then referred to the publishing activities of the B.M.A., including their exposures of quack cures before World War I. He suggested that there was reason to publish another book entitled "The TV Advertising Viewer's Guide". He commended the B.M.A. for the interest it had taken in physical fitness, as shown by its 1936 report, saying that the Association had had the foresight and temerity to look into any question which remotely affected the health of the individual.

Returning to the relation of the B.M.A. to freedom and democracy, he thought that it was a good thing to remember that these terms were not simply abstract ideas but the result of highly practical organization. As a practical step towards international co-operation in medicine, the B.M.A. had gone on to establish the Commonwealth Medical Conference and had also been instrumental in founding the World Medical Association. These organizations were obviously important for medical men the world over, but they had a deeper significance. Some people believed that international co-operation could be achieved only by some supranational agency, but in the meantime it seemed to him that the best chance of achieving some kind of universal understanding was for all similar professional organizations throughout the world to fashion the closest relations between each other. In this the medical profession had led the way, and there was a real chance that the World Medical Association would develop an influence and a prestige similar to that which the B.M.A. had achieved in Britain.

Dr. Arthur Beauchamp, Chairman of the Representative Body of the B.M.A., proposed a vote of thanks to Prince Philip, and the new President then led the platform party out of the hall.

Council Dinner at Guildhall

The afternoon installation ceremony was followed by a Council Dinner of the B.M.A. in the Guildhall at which Dr. S. Wand, Chairman of Council of the B.M.A., presided, with Prince Philip as the principal speaker. About 800 members and guests were present to hear the new President propose the traditional toast of "The Common Health". Prince Philip said that the first time he had proposed this toast was in 1954 when he became an honorary member of the B.M.A., so that this made no less than four times that he had had to speak on the subject of medicine or health. For someone who was not a hypochondriac or a doctor, this was quite a strain. He felt the choice of title for the toast rather odd. He said "it is almost as if I had been asked to propose a toast to pedestrians at the Society of Motor Manufacturers and Traders' dinner, or even a toast of teetotallers at the Licensed Victuallers Association's banquet." He felt however that the term "Common Health" described quite well the sort of no man's land between positive good health and active bad health; this no man's land was the province of a new scientific or medical discipline which might be called the pathology of social diseases and which dealt with the problems, half medical and half social, afflicting the modern community. Their study required not only physicians but members of other professions, sociologists and the Church.

(Continued on page 949)

HOUSING APPLICATION FORM

93rd Annual Meeting, C.M.A.
Banff, June 13 - 17, 1960

Dr. P. G. Costigan,
Chairman, Committee on Housing, C.M.A.,
Box 1080, Banff, Alberta.

Please reserve the following accommodation:

.....Double room (bath or shower) Twin beds..... Double bed.....

.....Room for.....person(s) (bath or shower)

.....Motel Unit for.....person(s) (bath or shower)

In view of the large attendance expected, the hotels have few, if any, single rooms available. It might be to your advantage to share a room with another member. Please mention below the name of the person with whom you would like to share your accommodation; otherwise assignment will be made by the Housing Committee.

Names of persons who will occupy the accommodation requested above:
(Kindly print names and addresses.)

NAMES (Dr. and Mrs.).....ADDRESS(ES).....

.....

I (we) will arrive in Banff on June.....at.....a.m./p.m.

I (we) will depart from Banff on June.....at.....a.m./p.m.

Travelling by: Automobile..... Train..... Bus.....

Please name accommodation desired and check choice*:

	First	Second	Third
Hotel:	.....	.....	.....
Motel:	.....	.....	.....

NAME.....

ADDRESS..... .....

.....

TELEPHONE No.....

*A list of hotels and motels is shown on the following page with daily rates.

N.B.: Confirmation of housing will be made direct from hotel or motel.

THIS WILL CONSTITUTE YOUR ADVANCE REGISTRATION FOR THE MEETING.

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HOTELS AND MOTELS AVAILABLE FOR ANNUAL MEETING, BANFF, ALBERTA, JUNE 13 - 17, 1960

Daily rates

ALPINE MOTEL

Two-room units, two double beds, shower baths, kitchens—four persons	$14.00
Three-room unit, three double beds, shower bath, kitchen—six persons	18.00
Two-room units with twin beds, shower baths—four persons	14.00
One-room unit with double bed, tub bath—two persons	10.00

ARROW HOTEL

Double bed and shower bath	$10.00
Twin beds and tub bath	12.00
Suites—consisting of two twin-bedded rooms and tub bath	20.00

BANFF SCHOOL OF FINE ARTS

Administration Bldg.—Twin bedroom with bath—per person	$ 5.00
Chalets—Twin bedroom with bath—per person	4.00

BANFF SPRINGS HOTEL

Per person in single room daily including meals	$20.00
Per person (two in a room) daily including meals	17.00
Per person (three in a room) daily including meals	16.50
Per person (four in a room) daily including meals	15.50
Per person (five in a room) daily including meals	15.00
Suite rates on American Plan. An additional charge is made for the parlour and the regular American Plan rate applies to the bedrooms.	
Suites—two bedrooms and parlour—Parlours are daily additional	35.00
and daily additional	30.00
Suites—one bedroom and parlour—Parlours are daily additional	30.00
and daily additional	25.00

BECKER'S BUNGALOWS

Each bungalow contains individual log fireplace, shower bath and kitchenette	
Double bed—bungalow	$10.00
Twin beds—bungalow	12.00
Two double beds—bungalow	14.00

BEL-PLAZA MOTEL

Double bed and bath—2 persons, per day	$ 9.00
Double bed and bath—2 persons, per day	10.00
Twin beds and bath—2 persons, per day	11.00
Two bedrooms and bath, 4 persons, per day	12.00
Two bedrooms and bath, 4 persons, per day	14.00
2-bedroom and sitting room and bath, per day	16.00
Double bedroom and twin-bed sitting, per day	17.00
Two bedrooms, living room and kitchenette and bath—6 persons, per day	18.00
Double bed and bath	11.00
Twin bed and bath	12.00
(Each additional person)	1.50

BREWSTER MOTEL

Two double beds, dressing room and bath—two persons	$12.00

Daily rates

CASCADE HOTEL

Twin-bedded rooms with private toilet and basin.
Twin-bedded rooms with private toilet and basin and TV.
Double or twin-bedded rooms with private bath.
Rates to be announced in a later issue.

KING EDWARD HOTEL

Twin-bedded rooms with private bath.
Double-bedded rooms with private bath.
Twin-bedded rooms with washbasin only.
Double-bedded rooms with washbasin only.
Rates to be announced in a later issue.

CHARLTON'S CEDAR COURT

Cabins with two double beds in separate rooms with no cooking—showers—per night	$12.00
Cabins with two double beds in separate rooms and cooking. Some with shower and some with bath—per night	12.00
Cabins with twin beds in the bedroom and a double bed in the living room—cooking, shower	14.00
Cabins with a double bed in the bedroom and Duo-bed in the living room, cooking, some with shower and some with bath	14.00

THE HOMESTEAD MOTEL

Singles with bath	$7-$ 8.00
Twin-bedded rooms	$9-$10.00

THE GAMMON MOTEL

Twin-bedded rooms each with combination bath and shower	$12.00

MOUNT ROYAL MOTEL

Twin beds with bath	$13.00
Double with bath	13.00
Twin with bath	8.50
Twin with bath	13.00
Double with bath	10.00
Suite—connecting bath—4 persons	16.00
Suite—connecting bath—4 persons	17.00

KEN-RIC MOTEL LTD. (Gehman's)

Double beds and private bathroom, per day	$ 7.00
Twin beds and private bathroom, per day	8.00

RAINBOW CHALETS

Rates to be announced in a later issue.

SCRATCH'S BUNGALOWS

Rates to be announced in a later issue.

TIMBERLINE HOTEL

Large bedsitting rooms—some 4 persons each—private bath and/or shower.
Two-room suite, private bath and/or shower.
Twin-bedded rooms—private bath and/or shower.
Rates to be announced in a later issue.

INSTALLATION OF PRINCE PHILIP

(Continued from page 946)

He said, "I discovered from your Chairman that Plato was supposed to have said that medicine separated man from his soul but I suggest that we seem to have separated man from his community. I quite expect to be told after this that you know all the answers already, in which case the only thing I can say is that you seem to be extremely unsuccessful in applying them to the problem." His Royal Highness then varied the toast and proposed "the Toast of the Common Health—May it soon give way to positive good health in individuals and communities." The Rt. Hon. Viscount Kilmuir responded to this toast, after which the toast of the retiring officers of the B.M.A. was proposed by Dr. Wand and responded to by Sir Arthur Thomson. Dr. Arthur Beauchamp proposed the toast of the guests, and this was responded to by His Grace, The Archbishop of Canterbury, and Dr. E. Kirk Lyon. The latter said that the professional brothers of the B.M.A. in Canada did not consider themselves to be guests at functions of the B.M.A. but members of the family, a feeling which has been intensified at the recent joint annual meeting in Edinburgh. Dr. E. Kirk Lyon assured the new President that the memory of his visit to Canada was vivid, and the challenge he had thrown down when installed as C.M.A. President had not gone unheeded.

THE WEEKLY JOURNAL

In a month from now, this Journal enters its fiftieth year of publication. During all this period, in spite of wars, depressions, and those peculiar natural phenomena known to insurance companies as Acts of God, the Journal has regularly appeared. For 45 years it was a monthly, for five years it has been coming out twice a month, and now as of Saturday, January 2, 1960, it will be mailed out each Saturday as a weekly publication.

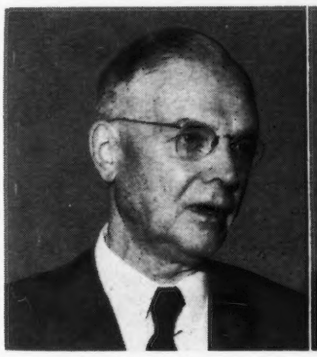
The decision to make the Journal a weekly was not lightly taken. If this Journal were to be regarded as a museum for recording events long past, there would be no point in increasing the frequency of its publication. But your representatives and officers in the C.M.A. believe that it should be a live and lively Journal, not only for recording scientific progress but also bringing medical news to you—news about your Association, and news about any event in Canada which may have repercussions on the practice of medicine.

To do all this and to give service to our membership costs money, and this money must be forthcoming from our advertising. In recent years, our ability to print more material, to reproduce more illustrations (a costly business), has been due to the very gratifying increase in support not only from our old friends in the business of supplying the doctors' needs, but from many new ones.

A recent survey of our learned contemporary, *The New England Journal of Medicine*, showed that some 80% of readers of that journal studied the advertisements. We believe that a similar survey here might yield similar figures. Within the advertising pages, conveniently placed side by side for your scrutiny, are the announcements which make the Journal possible. We hope and expect that readers will continue to show the advertisers the courtesy of studying their announcements, just as they study the editorial content too. They deserve our support.

SENIOR LIFE MEMBERSHIP

At the Annual Meeting of the Saskatchewan Division of the Canadian Medical Association, held in Saskatoon in October in conjunction with the 52nd Annual Meeting of the College of Physicians and Surgeons of Saskatchewan, Senior Life Membership in the C.M.A. was awarded to Dr. Herbert Clegg George of Regina in recognition of his contribution to medicine, the community and the country.



Dr. Harvey Crawford Boughton

Dr. Herbert Clegg George

Dr. George, who was born in Port Hope, Ont., graduated in medicine from the University of Toronto in 1910. After postgraduate studies at St. Francis Hospital in Pittsburgh, he commenced practice in Glenavon, Sask., in 1913. Two years later he moved to Regina to become associated with Drs. Johnstone, Harvie and Alport; his work with this group was confined largely to internal medicine. From 1932 to 1936, in addition to carrying on a busy practice, Dr. George served as Director of Cancer Services for Saskatchewan and Director of the Regina Cancer Clinic on a part-time basis. In collaboration with Dr. J. M. Uhrich and Dr. F. D. Munroe, Dr. George established and developed the pattern of the cancer clinics as they exist in Saskatchewan today. In 1936 he retired from private practice to become the first full-time director of the cancer clinics in Saskatoon and Regina. Through his efforts and those of his associates, a group of well-trained cancer specialists was brought to the two centres in Saskatchewan to follow in his footsteps in this new and developing field. Retiring from his work with the cancer clinics in 1945, Dr. George returned to the practice of internal medicine in Regina, where he is still actively engaged in this work. In the same year he obtained his certification in Internal Medicine from the Royal College.

At the same session, a Senior Life Membership Certificate of the College of Physicians and Surgeons of Saskatchewan was awarded to Dr. Harvey Crawford Boughton of Saskatoon. Dr. Boughton, a native of Manitoba, graduated in medicine from the University

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of Manitoba in 1914. After two years of postgraduate work in Winnipeg and a period of three years in general practice, he joined Dr. R. G. Ferguson at Fort Qu'Appelle Sanatorium. In 1925 he moved to Saskatoon to become superintendent of the new sanatorium, where he remained in active work until his retirement last April. Dr. Boughton's main interests in the field of tuberculosis were in the preventive field and in case-finding by the use of tuberculin. His interest in B.C.G. vaccine was stimulated by postgraduate work in Great Britain and on the Continent, and on his return to Canada he immediately put this new knowledge to work in Saskatchewan. Dr. Boughton received his certification in Internal Medicine (T.B.) from the Royal College in 1947. He is a past president of the Saskatoon and District Medical Society.

ASSOCIATION OF CANADIAN MEDICAL COLLEGES

The Association of Canadian Medical Colleges, an association whose members consist of the twelve Deans of medical colleges in Canada, held its annual meeting in Winnipeg on Friday and Saturday, November 6 and 7, 1959. Dr. Lennox Bell, Dean of the Faculty of Medicine, University of Manitoba, was in the Chair and a number of visitors were present for part or all of the meeting. Two new Deans, Dr. J. C. McCreary of the University of British Columbia and Dr. Walter MacKenzie of the University of Alberta, were introduced.

Brief reports were received on the visits of the accreditation team from the Association of American Medical Colleges to the University of Alberta, the University of Western Ontario and the University of Ottawa. Dr. J. Thompson of the University of Alberta, Secretary to the A.C.M.C., presented an interesting statistical summary of Canadian medical education in which such material as the numbers of registrations by year for each medical college in 1958-59, the marital status of Canadian medical students, the numbers of foreign students registered in Canadian medical schools, the numbers of graduate students in Canadian medical schools, the other teaching duties of members of the faculty of medicine, the numbers of full-time faculty members and their degrees, the methods of payment of staffs of Canadian medical schools, and the sources of funds for Canadian medical education were tabulated. Federal and provincial governments provide roughly three-quarters of the funds needed for medical education in Canada at present. (This material will be printed in full in the Education Number of the *Canad. M. A. J.* next April.)

Universities and Graduate Training

Dr. J. W. Scott of Edmonton, Alberta, introduced and Dr. Donald Thompson of Bathurst, N.B., read a brief on the relationship between the universities and graduate training in medicine in Canada. Dr. Thompson said that the demand for specialty training seemed to be continuing at a high level and is probably increasing. There were 1926 living Fellows of the Royal College, and 5951 certificated specialists. About 140 hospitals and institutions in Canada had been approved by the Royal College for advanced graduate training in one or more specialties, and of these 93 had some form of university connection and 47 no university connection either at undergraduate or graduate level. It appears that there are approximately 1500 physicians occupying these training residencies. The number of candidates for the Fellowship and certification examinations in recent years has been in the neighbourhood of 1000. As the years have gone by and the number of hospitals requesting approval for graduate training has increased steadily, the Committee on Approval of Hospitals and the Council of the Royal College have become increasingly concerned about the place of institutions with limited facilities, able to offer one or two years of acceptable practical training in one or more specialties but not associated with a formal training program and in some instances lacking facilities for training in related basic sciences. Council feared that some candidates might take the major portion or indeed all of their graduate training in such hospitals. Council also considered that the medical schools of Canada had a responsibility not only in undergraduate teaching but also in graduate training. It seemed logical therefore that the Royal College should work with the medical schools in the latter field. It was proposed that medical schools examine their responsibilities in the field of graduate training and co-operate with the Royal College in expanding the number of university-sponsored plans of graduate training in the specialties in Canada. This did not mean that an attempt was being made to shift responsibility for development of graduate training plans wholly to the universities. In seeking the help of the latter the Royal College was attempting to bring better order out of a situation which had now become somewhat out of hand. The Royal College was concerned with assurance of high standards in respect to: (a) qualifications of hospital staff engaged in specialty training; (b) quality of the training program itself; (c) qualification of candidates for training; (d) scrutiny of candidates' performance during training. It is believed that these standards could best be obtained by some formal relationship between hospitals engaged in specialty training and the universities. In some instances training plans might involve the facilities of several universities rather than one. Such an involvement had already occurred in ophthalmological training in the east, and a far-seeing and original scheme for neurosurgical training on a regional basis across the nation had been proposed.

After debating this brief, the Association of Canadian Medical Colleges passed a resolution expressing its interest in graduate training and accepting its responsibilities, and signifying its willingness to co-operate with the Royal College of Physicians and Surgeons in this, hoping that medical schools would examine closely their responsibilities in this field.

Two matters concerning the Medical Council of Canada were then debated. The Association once more questioned the need for two separate sets of examinations—the university examinations for the degree of Doctor of Medicine, and the examinations of the Medical Council of Canada—before Canadian

graduates were permitted to practise. The Association suggested that the Medical Council of Canada restrict their examining function for graduates of Canadian schools to oral and clinical examinations at the end of the intern year, omitting a second set of written papers. The second subject debated was the question of approval of internships by the Medical Council of Canada. It was felt that the provincial licensing bodies should play an important part in approving hospitals for intern training, and a little disquiet was expressed at the facilities offered by some hospitals presently approved for this purpose. One member of the Association pointed out that more internships were available in Canadian teaching hospitals last year than the number of students graduating. On the other hand, some internships in teaching hospitals might not be satisfactory because of lack of pædiatric and obstetric training. The Association intends to request a seat on the C.M.A. Committee for Approval of Hospitals for the Training of Interns.

The Association of Canadian Medical Colleges decided to hold a special meeting in Montreal on January 18 to discuss the relationship of faculties of medicine to teaching hospitals.

It was decided to take out a corporate Canadian membership in the Association for the Study of Medical Education, a British body recently formed.

Undergraduate Teaching and the G.P.

Dr. Wendell Macleod of the University of Saskatchewan discussed the problem of undergraduate teaching and the general practitioner, with particular reference to the experimental approach in his own university. He recalled the arguments that the nature of hospital medicine was different from that of general practice, and the various schemes discussed for utilizing general practitioners as teachers in university teaching hospitals. At Saskatoon, 18 to 20 general practitioners had been attached to six university hospital departments, but no formal university department of general practice had been set up. After one year any of these general practitioners was free to change his department and three had actually moved from one to the other. Departments involved included medicine, obstetrics, surgery, orthopædic surgery, psychiatry, anæsthesia and pædiatrics. An attempt had recently been made to assess the success of the experiment by questionnaire among university teachers. Replies to the questionnaire revealed no unanimous agreement on the role of the general practitioner in a teaching hospital. It seemed however that there was no virtue in having him demonstrate his versatility. His distinctive contributions came through his knowledge of the patient's family and social setting, and his knowledge of the patient's history over a long continuous period. Another approach had been to set up preceptorships which students must take for two weeks in summer before their fourth year. These had proved helpful in relieving the student of his fear that all the problems encountered in general practice would be difficult ones, and in balancing his educational outlook. Dr. Macleod noted that there had been practically no difficulty with patients over the scheme for use of general practitioners as teachers in the university, and that liaison had been close with the College of General Practice of Canada.

Symposium on Teaching of Preventive Medicine

Most of Saturday afternoon was devoted to a symposium on the teaching of preventive medicine in Canada. The subject was introduced by Dr. Chester Stewart of Dalhousie University, who analyzed the differences in the content of courses on social and preventive medicine in various medical schools in Canada. He thought that these differences should be maintained and that the courses should not just be standardized to fit the requirements of the examinations of the Medical Council of Canada. He pointed out that even the name of the department varied from school to school; in some schools it was the Department of Public Health, in others the Department of Hygiene, in others the Department of Preventive Medicine and so on. The years in which the course was given varied from the first to the fourth with all possible combinations. Content of the course also varied greatly but subjects included biostatistics, nutrition, the general attitude of the clinician to preventive medicine, sanitation, epidemiology, housing, school health, organization of health services and of departments of public health, community programs, clinical preventive medicine (tuberculosis, maternal and child health, degenerative diseases, industrial diseases, mental diseases), medical economics and health insurance. Much of the groundwork of these subjects was of course covered in other departments such as those of medicine, psychiatry and obstetrics. He felt that a basic floor for the content of the course should be established but that the course should not be defined in full nor should any censorship of teaching be instituted. He described the shift in orientation of the paper on public health in Medical Council of Canada examinations away from traditional subjects such as sanitation towards clinical preventive medicine. However, something must continue to be taught about the traditional subjects.

Dr. Roper Cadham of Winnipeg then spoke on the use of facilities of a local health department in the teaching program in social and preventive medicine, illustrating his talk with lantern slides. He said that in Winnipeg the first contact of the medical student was with the bacteriological department in the study of food sanitation and food poisoning. This part of the program included visits to restaurants. In the second year the bacteriology of dairy products was studied and visits to a pasteurizing plant were arranged. Later, in connection with studies of meat hygiene, visits to a meat-packing plant were carried out, and a sewage plant was also visited. In Winnipeg, the City Health Department was responsible for sick calls to a number of people on social assistance, etc. When these involved a communicable disease, it was customary to take two students with the Health Department physician to see the case. In their fourth year, students saw the child health services and witnessed school medical examinations and the management of the handicapped together with immunization procedures, visits to nursing homes and individual homes. A student was taken by the public health nurse on home visiting. He felt

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that the Department of Preventive Medicine was so closely integrated with those of pædiatrics, bacteriology, etc., that as a department it was almost redundant.

Dr. A. Robertson, Professor of Preventive and Social Medicine in the University of Saskatchewan, described the concept of social medicine in that university. He pointed out that the term "social medicine" for the application of medical knowledge to man and his social state had been used in Edinburgh early in the nineteenth century. The department at Saskatoon was only one year old and was embarking on a study of its objectives with the knowledge that this study would be a continuing one. His department recognized two distinct functions: (1) to offer the student the opportunity to learn about things of which the department of social medicine had a special knowledge; (2) to help the student to get his whole medical training into perspective and to unite the fragments of his knowledge. The subject could be divided into four parts—health administration and practice, epidemiology, social aspects of health and disease, and environmental control. He was not impressed with the argument that the best type of doctor would teach the social aspects of disease in his own university department of medicine or obstetrics, etc. If this was used as an argument to do away with the department of social medicine, it would be equally valid to abolish the departments of pathology or biochemistry on the grounds that the clinician would deal with these subjects himself. Although the behavioural sciences were very underdeveloped in comparison with the physical sciences, enough knowledge was now available to justify their place as basic sciences in medicine. Dr. Robertson described the third-year student's project in social and preventive medicine, in which students were assigned an individual disease such as leukæmia or diabetes, given guidance for reading and asked to prepare a report which would answer a series of questions on social aspects of the disease. The speaker also stressed the great importance of good liaison between his department and other departments, particularly those of psychiatry and pædiatrics. (It is hoped to print in the Education Number of the *Canad. M. A. J.* next April a fuller account of the work of this department.)

The following officers were then elected by the Association of Canadian Medical Colleges: president: Dr. G. H. Ettinger of Queen's University; first vice-president: Dr. Wilbrod Bonin of the Université de Montréal; second vice-president: Dr. Wendell Macleod, University of Saskatchewan; members of council, Drs. Lloyd Stevenson of McGill and Chester Stewart of Dalhousie. The next annual meeting of the Association will take place in Toronto.

Only one other item was discussed before the meeting adjourned, and this was a future plan for new Canadian medical schools. A resolution was eventually adopted suggesting that the Canadian Medical Association and the Royal College of Physicians and Surgeons of Canada combine with the Association of Canadian Medical Colleges to form a committee in order to discuss the establishment of a secretariat to assess the present facilities for undergraduate medical education in Canada, and to consider the possible establishment of new medical schools and their location.

MEDICAL MEETINGS

SECOND INTERNATIONAL CONFERENCE ON MENTAL DEFICIENCY

The American Association on Mental Deficiency sponsored and held the First International Conference on Mental Deficiency in Boston in 1948.

As a contribution to World Mental Health Year, 1960, the American Association on Mental Deficiency has initiated plans for a Second International Conference on Mental Deficiency in co-operation with the Royal Medico-Psychological Association and the British Psychological Association. This conference is known as the "London Conference on Scientific Aspects of Mental Deficiency".

The London Conference will deal with the latest medical, psychological, social, educational and administrative developments in the field of mental deficiency. It is open to professional workers in the field. Meetings will be held in London during July 24 to 29, 1960, and will precede the meetings of the World Federation for Mental Health to be held in Edinburgh from August 7 to 12, 1960. Plans are being made for visits to residential facilities and training centres in England between the end of the London Conference and the opening of the Edinburgh meeting.

In order to complete detailed plans, the organizers of the Conference would like to determine the approximate number of professional people who might be attending the London Conference.

Those interested in receiving additional information on the London Conference are asked to write to: Harvey A. Stevens, Chairman, AAMD Committee on International Conference on Mental Deficiency, 301 Troy Drive, Madison 4, Wisconsin, U.S.A.

PUBLIC HEALTH

SURVEILLANCE REPORTS OF EPIDEMIC OR UNUSUAL COMMUNICABLE DISEASES

PARALYTIC POLIOMYELITIS

CANADA—During the 40th week (ending October 10) and 41st week (ending October 17), 101 and 70 cases of paralytic poliomyelitis, respectively, were reported to the Epidemiology Division, Department of National Health and Welfare. The number of cases reported in week 40 was the lowest since August 8, while the total for week 41 is the lowest since August 1 (30th week).

The last two weeks represent the first apparent downward trend, following the eight consecutive weeks, from the week ended August 15 to October 3, during which the weekly incidence varied from a low of 103 cases to a peak of 139 cases (week 36).

A downward trend is apparent in most of the provinces except Newfoundland, Alberta and British Columbia. In Newfoundland, the last three weeks have seen the lowest reporting since August 22, but the downward trend is not definite yet. Alberta has reported in the last two weeks the highest number of cases this year, while in British Columbia the number of cases reported in week 41 is the second highest this year. Saskatchewan, after reaching the highest figure this year in week 40 with 8 cases, reported only one case in week 41.

PARALYTIC POLIOMYELITIS IN CANADA*
42ND WEEK—ENDING OCTOBER 24, 1959

	Reported cases					Deaths	
	1959			1958		1959	1958
	This week	Last week	To this date	This week	To this date	To this date	To this date
Canada	60	71	1451	15	218	130	21
Newfoundland	4	7	132		4	10	
Prince Edward Island	2		6			1	
Nova Scotia	1	1	4				
New Brunswick	2	1	43	2	4	5	1
Quebec	31	39	918	4	64	75	2
Ontario	3	6	174	1	18	15	6
Manitoba	1		23	7	97	2	9
Saskatchewan		1	29		1	3	
Alberta	6	6	45	1	21	3	1
British Columbia	10	10	66		8	11	2
Yukon			1		1	1	
Northwest Territories			10			4	

*Weekly returns based on telegraphic reports by provinces.

QUEBEC—The number of cases of paralytic poliomyelitis for the week ending October 17 is the lowest since August 1 and about 42% less than the figure for the previous week.

While for Montreal and the metropolitan area the number of cases admitted is the lowest since July 18, the number of cases reported from the rest of the province is still relatively high.

In Quebec City, to October 10, 61 paralytic poliomyelitis patients were hospitalized, six from the city and 55 from outside. Sixteen deaths have been reported, two in patients from the city and 14 among patients originating from outside the city.

INFECTIOUS HEPATITIS

NOVA SCOTIA—Twelve cases of infectious hepatitis have been reported from Port Williams and Kennetcook.

STAPHYLOCOCCAL FOOD POISONING

ALBERTA—*Lethbridge*—Four out of five people partaking of a Boston cream pie have been affected. *Staphylococcus aureus* was isolated from the pie and from the nose and throat of the person who prepared the pie.

Indian and Northern Health Services

SYPHILIS

Hay River, N.W.T.—An outbreak of syphilis has occurred in this community of about 800 people. In the space of a few days, 20 cases have been seen in Indians, Metis and whites. Serological reports on eight patients confirmed the clinical diagnosis.

Dr. L. E. C. Davies, Zone Superintendent, MacKenzie District, is investigating the outbreak. He reports that there

SUMMARY OF REPORTED CASES OF NOTIFIABLE DISEASES IN CANADA*
ISSUED BY THE PUBLIC HEALTH SECTION, DOMINION BUREAU OF STATISTICS

Disease	Week ended (1959):				Cumulative total since beginning of year	
	Sept. 19	Sept. 26	Oct. 3	Oct. 10	1959	1958
Brucellosis (Undulant fever) (044)	5	3	2	4	77	78
Diarrhœa of the newborn, epidemic (764)	—	—	5	3	62	‡
Diphtheria (055)	1	1	1	—	19	36
Dysentery:						
(a) Amœbic (046)	—	—	—	—	2	8
(b) Bacillary (045)	62	41	51	52	693	1072
(c) Unspecified (048)	2	1	7	10	72	1
Encephalitis, infectious (082.0)	3	—	2	—	37	21
Food poisoning:						
(a) Staphylococcus intoxication (049.0)	—	4	5	—	10	—
(b) Salmonella infections (042.1)	22	26	14	18	469	440
(c) Unspecified (049.2)	—	2	61	—	62	217
Hepatitis, infectious (including serum hepatitis) (092, N998.5)	78	49	64	84	3417	2742
Meningitis, viral or aseptic (080.2, 082.1)	106	75	28	37	582	32
Meningococcal infections (057)	4	5	3	2	155	216
Pemphigus neonatorum (Impetigo of the newborn) (766)	—	—	—	—	7	‡
Pertussis (Whooping cough) (056)	294	385	186	172	4810	4880
Poliomyelitis, paralytic (080.0, 080.1)	93	97	153	167	977	156
Scarlet fever and Streptococcal sore throat (050, 051)	131	144	156	256	16,225	6849
Tuberculosis:						
(a) Pulmonary (001, 002)	107	57	117	84	3577	4205
(b) Other and unspecified (003-019)	36	10	30	23	1048	1394
Typhoid and Paratyphoid fever (040, 041)	2	3	12	9	472	234
Venereal diseases:						
(a) Gonorrhœa (030-035)	305	221	358	360	10,416	10,835
(b) Syphilis (020-029)	37	38	63	36	1526	1457
(c) Other† (036-039)	—	—	2	—	6	4

*Excluding Northwest Territories. Figures for the Yukon are received four-weekly and are, therefore, shown in the cumulative totals only.

†Including chancroid, granuloma inguinale and lymphogranuloma venereum.

‡Not reportable.

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is an epidemic of syphilis in this community. About 30 cases were reported during the year and many more are being found now. A vigorous case-finding campaign is under way.

RABIES

Orillia, Ontario—Six Indians from the Simcoe Agency were given anti-rabies vaccine after having been bitten by a suspect rabid dog.

Epidemiology Division,
Department of National Health and Welfare, Ottawa.
October 17, 1959.

LETTER TO THE EDITOR

THE ACTION OF FLUORIDES

To the Editor:

There have been so few reports of the action of the fluorides by practising physicians that a bona fide survey of patients who have taken fluorides on prescription during the last three years is the subject of this presentation. It should bear more weight than much of the propaganda in favour of fluoridation which is made up mainly of hearsay evidence, references, theories and unqualified affirmations.

In 1959 a reliable pharmaceutical firm brought out two vitamin-mineral preparations containing fluorides. One was a syrup in which sodium fluoride was present in the amount of 3 μg. per dose. The other was a tablet in which calcium fluoride was present in the amount of 25 μg., or more than eight times the strength of the sodium fluoride.

I gathered nine cases from my files in which I had tested these fluorides by prescribing the above preparations. Five patients who had taken calcium fluoride in tablet form had no side effects whatsoever and are well today. Four patients who had taken the soluble sodium fluoride in the syrup form presented side effects. One patient was told by her employer to see her doctor as she looked so ill. She had not been examined for over six months in 1956 and had had her prescription refilled repeatedly. She had lost 6 lb.; her skin was a bad colour, and she was wrinkled and shrunken to such an extent that I was shocked by her appearance; her hair was falling out to an alarming degree and she felt as ill as she looked. I stopped the syrup after deciding that her symptoms were due to the sodium fluoride's robbing her body of calcium. In a little over a month she had regained her weight and the other symptoms had subsided. The second patient returned after six weeks, in the middle of 1956, with bladder irritation; mental disturbances which made her think she was "going mental"; lack of calcium as evidenced by softness of nails, deterioration of skin and falling out of hair. She was also advised to stop the syrup. The third patient could not take the syrup at all as each dose made her nauseated. The last patient did not return for examination. That was the last time I have prescribed preparations containing sodium fluoride. In my practice I have little place for the fluorides and that is why so few were treated. Several bad results and the wise practitioner is through with the drug.

A few words here about fluorine would be appropriate. There is clinical proof to show that the unstable forms of fluorine deprive the blood and tissues of calcium. In that way they exert their poisonous effect, which is mild or lethal according to the quantity of fluorine present. Of course calcium fluoride does not act in that way as it already has its full quota of calcium and is a stable product. To sum up then, these few chosen cases show that sodium fluoride is not to be taken internally while, on the other hand, calcium fluoride can be taken without apparent ill effects. That is the important result of this survey.

WILLIAM A. COSTAIN, M.D.

1567 Bathurst Street,
Toronto, Ont.,
October 28, 1959.

THE LONDON LETTER

(From our own correspondent)

REFORMING THE NATIONAL HEALTH SERVICE

During the last few years a series of stimulating reports on current political problems has appeared under the ægis of what is known as the Bow Group. This is a research organization which "enables young men and women with Right Wing views to collaborate in studying political and social problems". The Group has now turned its attention to the National Health Service, and in the current issue of its quarterly publication *Crossbow*, it comes out strongly in favour of radical reform of the National Health Service. "A government department," it contends, "may be the right body to organize guns and roads, but a nation's health is not so amenable to minutes and Ministerial dicta." What it proposes therefore is that "the Health Service should be removed from direct governmental control and that responsibility for its central organization and administration should be removed from the Ministry of Health and an independent body set up to manage its affairs".

The new body, similar in nature to the British Broadcasting Corporation, should have a charter derived from Parliament but should be largely autonomous. Its members should consist, not of civil servants, but of "men and women of distinction, medical and lay, imbued with that spirit of caring which inspired the building of the old voluntary hospital system". It would "enjoy greater flexibility in planning while still working to a firm budget". Further, "it would enjoy the confidence and respect of the medical, nursing and allied professions, which the Ministry of Health is so conspicuously unable to command". This is by no means a new concept, but coming from this particular source it holds out hope that perhaps one day health standards will be prescribed by doctors and not by bureaucrats.

CONVALESCENT TREATMENT

"The treatment of convalescence has remained a medical and nursing backwater, largely unaffected by the main stream," according to a report on "Convalescent Treatment" just published by the Ministry of Health. The report, prepared by a working party appointed by the Ministry to investigate the provision

of convalescent homes in the London area, appeals for "a more vigorous attack along the lines of rehabilitation for the sick similar to that developed in rehabilitation for the disabled". There is no shortage of convalescent beds, but they are not being put to the best use. Times have changed and the proportion of cases in which a period of passive convalescence is essential has greatly diminished. Among the recommendations put forward is a trial of the use of accommodation for convalescents for preventive and preparatory treatment. This would include the preoperative admission of patients in sub-standard health. At the moment, these patients are admitted to hospital where they occupy beds for unnecessarily long periods. One large gynæcology department, for instance, reported that nearly all its patients had to be admitted to hospital at least a week before operation to prepare them and improve their general physical condition. This could equally well be done in a properly equipped convalescent home, thereby allowing the hospital beds to be more effectively used. Another recommendation is the experimental provision of day convalescent centres based on the departments of physical medicine at general hospitals in large centres of population.

White Pills for Children

The recently published annual report of the Medical Officer of Health for Plymouth contains an interesting section on the preference of children for coloured tablets. The aim of the investigation, upon which this section is based, was to obtain information that might help in reducing the incidence of poisoning due to children eating coloured medicinal tablets they find lying around the homestead. The results show that among 613 children studied, whose ages ranged from 1 to 8 years, bright colours were the most popular, with magenta heading the list, followed by pink and blue. Brown was surprisingly high up on the list, but this is attributed to its suggesting chocolate to the children. Black and wine were at the bottom of the list. White was not in the popular range, and this is attributed to the children's associating white with medicinal pills rather than sweets. The conclusion reached is the eminently sensible one that medicinal tablets should be kept white "in order that they should look like 'pills', rather than that attractive colours should be introduced which make them look like sweets".

History of Medicine

A Faculty of the History of Medicine and Pharmacy has been founded under the auspices of the Society of Apothecaries. Its aims are "to foster and extend more general interest in medical history, and to attract the co-operation of general historians, so that work in this field may be co-ordinated with wider historical studies". It is proposed to hold occasional symposia, discussions, congresses and joint meetings with other bodies. The inaugural lecture is to be given in December by Canon Charles Raven, D.D., of Cambridge, on "Medicine—Mother of the Sciences".

WILLIAM A. R. THOMSON

London, November 1959

OBITUARIES

DR. JONATHAN CAMPBELL MEAKINS

An Appreciation

The death of Dr. J. C. Meakins has deprived medicine of one of the most outstanding teachers, investigators and educators of this century. It was my good fortune to join his staff soon after he had returned to Canada from Edinburgh to become Professor of Medicine and Director of the University Clinic. The importance of this appointment lay in the fact that not only was it the first full-time position in medicine at McGill, but the University Clinic represented one of the earliest attempts to integrate the rapidly developing basic medical sciences into the fabric of internal medicine. Nowadays it is generally accepted that the well-trained internist not only will be conversant with the principles of the medical sciences but also will have access to laboratories, in which the practical application of these sciences to the problems of diagnosis can be made and in which most of the investigation on the nature of disease processes is conducted. Such laboratories were few and far between 35 years ago. Indeed much of the remarkable advance during the last 30 years in the ability of the physician to diagnose and treat disease is to be attributed to the establishment of such laboratories and to the recognition of the fact that progress in medicine can occur only in proportion to our increasing knowledge of the chemical and physical processes underlying cellular function.

Dr. Meakins realized this principle far in advance of his time and, in establishing the University Clinic in 1924, he made special provision for the construction of laboratories within the Royal Victoria Hospital in which clinicians and basic medical scientists could work side by side. He also comprehended quite clearly that the role of the basic scientist should not be merely that of applying his special skills to the study of problems of disease, a task that would relegate him to the role of a highly skilled assistant to the clinician, but should be one in which by daily contact with the problems of disease, the medical scientist would be inspired to think about disease processes as disorders of normal physiological events, and in turn devise investigations designed to lead to a better understanding of the nature of the deviation in chemical or physical terms.

I still have in my possession the letter which I received when I was a young physiologist working in the laboratory of Professor A. V. Hill in London and in which Dr. Meakins offered me a position in the University Clinic. In this letter he not only stated his belief in the great future importance of the basic medical sciences to clinical medicine, but with rare insight went on to say that he wished to gather into the laboratories of the clinic not only young clinicians interested in research but also physiologists and biochemists to work along with them. In addition he expressed his interest in the development of biophysics, a branch of the medical sciences which at that time was in its infancy. He stated further that the investigators in his laboratories would have a completely free hand in the selection of their problems, a promise which he fulfilled faithfully during the seven years of my association with him.

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My acceptance of this opportunity was perhaps the most fortunate decision I have made in my scientific career. At the Clinic I became a colleague of such people as E. H. Mason, Walter and Jessie Scriver, G. R. Brow and H. Dawson. Later we were joined by R. V. Christie and David Slight, and for a while, until the Neurological Institute was built, Wilder Penfield and William Cone occupied laboratories in the Clinic.

These were fruitful and exciting days as we pursued our particular interests and at the same time exchanged ideas and talked shop between ourselves and with the clinicians and medical students who gradually began to drop in to find out what "these men from metabolism", as we were called by our colleagues, were up to. Among the medical students who came and stayed to work with us were F. L. Horsfall, Jr., and G. T. Evans. Dr. Meakins also encouraged us to accept students for the Ph.D. degree in experimental medicine, and among these I recall Eleanor Venning and Rhoda Grant, since these two ladies were the first two Ph.D. candidates whom I had the privilege of directing in their work.

These brief recollections of the early days of the University Clinic convey an inadequate picture of the wisdom and understanding of the great man who directed its activities. Dr. Meakins not only gave us an opportunity to prove our worth as scientists but also shielded us from the criticism of those who failed to understand the significance of our presence in the hospital. He encouraged us when the world-shaking idea failed to be supported by experiment, and praised, far beyond our due, such success as we achieved. The years I spent in his department moulded my future, as I am sure it did for all those who worked with him. He lived to see his concept of a university department of medicine become the accepted pattern of such departments on this continent, and to see, I am sure with much pleasure, many of his students come to occupy positions of importance in such departments. Others will write more fully of his own great contributions to medical science, but I shall always remember him, not only for the gifted individual he was but for the warmth of his personality, his friendship and the loyalty and encouragement he gave to his colleagues and students.

C. N. H. LONG,
Sterling Professor of Physiology,
Yale University.

DR. JONATHAN CAMPBELL MEAKINS

AN APPRECIATION

Graduates of McGill University and physicians of the Royal Victoria Hospital will be in the forefront among the legion who will long recall and deeply revere the memory of Jonathan Campbell Meakins. His association with the University spanned nearly 60 years; he was Physician-in-Chief of the hospital for 23.

Professor Meakins had early the vision to recognize the significance and value of establishing for the study of medicine a full-time university department with adequate facilities for research. He initiated and became the first Director of the University Medical Clinic which accumulated an impressive reputation for its numerous contributions to biological science and postgraduate education. For nearly two and one-half decades he served as professor of medicine and director of the department and undertook weighty burdens which he carried with outward ease and always with high credit. Despite academic responsibilities which would have crushed a lesser man, he accepted additional administrative charges during the six years before his retirement and served as Dean of the Faculty of Medicine.

Professor Meakins was endowed with extraordinary perception, remarkable intellectual vigour and enthusiasm for scientific investigation which flowered throughout his long and dedicated life. He became Director of Experimental Medicine at McGill at the age of 31 and Christison Professor of Therapeutics at Edinburgh at 37. He was but 42 when he returned to McGill as Professor of Medicine and Director of the Department of Medicine. Perhaps because he had himself achieved much so early, he was constantly impelled to seek out and vigorously encourage young men of similar bent, even while they were in their student years. These he stimulated to prepare themselves for careers in teaching and research. How superbly he succeeded is evident from the long record of the many now eminent teachers and investigators who studied under him.

To his many students and numerous co-workers, he was a warm, sympathetic and devoted friend; a wise and thoughtful guide; an enthusiastic and stimulating advocate. To those who had the rare privilege of knowing him intimately and of studying with him closely, he offered boundless affection which was never withdrawn.

FRANK L. HORSFALL, JR.

DR. HARRY ALLAN CAVE, born in Dorchester, Ont., in 1899, died in Hôtel-Dieu Hospital, Windsor, Ont., on October 7. After graduating from the Collegiate Institute in Woodstock, he obtained degrees in Arts in 1932 and Medicine in 1935 from the University of Western Ontario. This was followed by an internship in Victoria Hospital and one year as assistant in mental diseases in Selkirk, Manitoba. The following three years were spent on a fellowship at the Mayo Clinic in Rochester, and during this time the University of Minnesota awarded him the degree of Master of Science in Medicine. He practised medicine in San Diego, California, for three years before returning to London, where he practised medicine and served as a lecturer and instructor in the University of Western Ontario until 1938, when he joined the Winthrop Chemical Company in Montreal. During World War II, Dr. Cave went to England with No. 10 General Hospital. Later, after being transferred to No. 4 General Hospital, he served in England and in France. After his discharge from military service with rank of Lieutenant-Colonel he continued with the Winthrop Chemical Company in Windsor, Ont. Dr. Cave was a member of the Essex County Medical Society and the Mayo Clinic Fellowship Society.

He is survived by his widow, the former Madeline Dart of Montreal, to whom the sympathy of the medical profession is extended.

J.W.B.

DR. ARTHUR MURRAY CLARE, 65, of Neepawa, Man., died on September 8. Born in Neepawa, he was educated there and at St. Andrew's College, Toronto. When the First World War broke out he was a student in Manitoba Medical College. He served in the Medical Corps and then returned in 1916 to complete his course. He became medical officer of 6th Durhams and was taken prisoner. After five years of pædiatric train-

ing in New York, he began practice at Winnipeg, where he was appointed Chief Pædiatrician of St. Boniface Hospital and to the pædiatric staff of the General, Children's and Grace Hospitals. He practised also at Langenberg, Saskatchewan, and at Neepawa.

He is survived by his widow and two sons.

Le DR VITAL CLEROUX est mort à Montréal le 11 octobre. Reçu à Laval (Montréal) en 1907 il avait été attaché à l'Hôpital Royal Edward ainsi qu'à l'Hôpital Notre-Dame et était gouverneur à vie de ces deux institutions. Le Dr Cléroux, membre de l'Association Médicale Canadienne depuis 1930, reçut un diplôme d'honneur du Collège des Médecins et Chirurgiens de la Province de Québec à l'occasion de ses cinquante années de pratique médicale. Aux membres de sa famille qui lui survivent, l'Association présente ses condoléances les plus sincères.

DR. HENRY A. HESSION, 77, died suddenly at his home in Toronto on September 25. Born in Clinton, Ont., he received his medical education at the University of Toronto and graduated in 1916. In World War I he served overseas as Medical Officer with the 58th Battalion, Princess Patricia's Canadian Light Infantry, and was wounded at Passchendaele. On his return to Canada he started to practise in Toronto, where he remained up to the time of his death.

Dr. Hession is survived by his widow, two sons and a daughter.

DR. LILIAN McDONALD, 64, one of the first five women to graduate in medicine from McGill University, died on September 15. She was born and educated in Montreal and in 1922 received her degree at McGill. Dr. McDonald was district medical officer for the Sault Ste. Marie board of education and was also active in medical society work.

She is survived by her husband, Dr. John McDonald of Sault Ste. Marie.

DR. FRANCIS P. McNULTY, 87, died in St. Joseph's Hospital, Peterborough, Ont., on September 6, after a short illness. A native of Port Dalhousie, Ont., he attended the University of Toronto and graduated in medicine in 1897. In 1900 Dr. McNulty opened a practice in Peterborough and became a member of the surgical staff of St. Joseph's Hospital. In the same year he was appointed to the city's board of health, on which he served as chairman in 1910-1911. The founding of the St. Joseph's Hospital School for Lay Nurses was largely due to Dr. McNulty's work and guidance. Failing eyesight forced Dr. McNulty to give up active practice in 1933, although he remained on the consultant staff of the hospital.

He is survived by his two daughters and two sons.

DR. VICTOR OWEN MADER, 58, died in the Victoria General Hospital, Halifax, on October 25. He was the son of the late Dr. A. I. Mader, and was educated in Halifax schools and at McGill University. In 1925, two years after graduation, he commenced his surgical practice in Halifax. He was a Fellow of the Royal College of Surgeons of Canada, and for eight years was a member of the College Council. Dr. Mader was a chief surgeon at the Victoria General Hospital and held the appointment of Chief Surgeon to D.V.A. Camp Hill Hospital.

Between World War I and World War II he was active in the militia, first as a Medical Officer in the Coast Artillery, and later in command of the 22nd Field Ambulance. He served overseas from 1939 to 1945. On "D" Day he landed in France in command of the No. 7 Stationary Hospital, with the rank of full Colonel.

Surviving are his widow and two daughters.

W.K.H.

DR. LEO I. RUTENBERG, 60, died on May 19 in Montreal where he was a general practitioner. He graduated from McGill University in 1923, and served with the First Division abroad and in Canada from 1939 to 1947.

He is survived by his widow. C.H.S.

PROVINCIAL NEWS

BRITISH COLUMBIA

The B.C. Foundation for Child Care, Poliomyelitis and Rehabilitation, at its annual meeting, reported on the work of the past year. It is sponsored by the Kinsmen's Clubs of B.C.

The retiring president, R. D. Howard, said that the organization's work in sponsoring free Salk vaccine clinics had been very successful, and had been a big factor in preventing epidemic polio in the province. Its work includes many aspects of prevention of disabling diseases and of rehabilitation. The Foundation spent $138,000 on treatment service, $107,000 on research and $12,500 on education. A total of 953 persons with physical disabilities, congenital or acquired, were directly aided by the Foundation this year.

Seventy-five Kinsmen's Clubs in British Columbia take part in this work—and special emphasis is laid on rehabilitation, prevention and research. Professor W. C. Gibson, a member of the Club, heads the Department of Neurological Research, and is specially interested in the work of the Foundation on poliomyelitis.

Funds provided by the Kinsmen have enabled the University of British Columbia to establish a School of Special Education, the first such school in any Canadian university, of which Dr. J. A. Richardson is the head as professor of special education.

Thirty delegates from British Columbia will be chosen to represent the province at the Canadian Conference on Children, to be held in Ste-Adèle, Quebec, in 1960. The conference will deal with child development and child welfare services in Canada. Dr. Jean McLennan of Vancouver is chairman of the British Columbia Provincial Committee. This committee is compiling data on premarital education for parenthood, evaluation of health services, hospital facilities and infant mortality.

Dr. Robert R. Noble, professor of medical research at the University of Western Ontario, has accepted the position of head of the University of British Columbia's Cancer Research Institute, which is to be built at the University shortly. Dr. Noble is a graduate of Toronto,

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and a D.Sc. and Ph.D. of the University of London. He is an F.R.S.(C) and has worked at McGill in the endocrinology department.

Students at the University of British Columbia gave 1744 pints of blood during a week-long drive. The Faculty of Nursing led all other students, giving 137% of their quota.

At the quarterly meeting of the North Okanagan Union Board of Health, held in September, Dr. Duncan McI. Black, medical director, had some interesting facts to report. Salk polio vaccine is in good supply, mainly owing to the "good housekeeping" of Miss E. Greene, nursing superintendent. Many adults have taken advantage of the free use of this vaccine.

Various travelling clinics are visiting this area—the Interior Travelling Tuberculosis Clinic in October, the Children's Travelling Clinic in November, and the Child Guidance Clinic in December.

A new pilot study is in progress in four British Columbia areas. Penicillin is supplied free of charge to rheumatic fever patients on recommendation of their doctor. This scheme has been carried out successfully in Saskatchewan.

A "rooming in" service has been instituted in Vernon Jubilee Hospital. Newborn infants are kept in their mothers' rooms, instead of in the nursery. The infants are freer of skin rashes, feed better and put on weight faster—and the mothers like it.

The Salmon Arm Hospital was opened on October 9.

Poliomyelitis has struck hard at the Indian village of Esperanza on the west coast of Vancouver Island and two children have died. Others are affected—one family has two sisters, 11 and 13, who are believed to have the bulbar type, and have been flown to Vancouver, and a brother of 9, with the spinal type. Other Indians are ill with the disease in the village, and neighbouring villages appear to be affected also.

A development which will be of interest to doctors as well as to the public at large is the possibility that the pharmaceutical profession will bring forward a "prescription insurance" scheme whereby any individual or family may, by payment of a monthly fee, receive all prescriptions free. The pharmacists estimate that 30% of prescriptions given to patients are never filled, largely because of the increasing costs of drugs.

There is at present one such scheme in operation in Canada, at Windsor, Ontario.

The British Columbia Pharmaceutical Association discussed this at their annual council meeting October 25 to 27.

Nanaimo is getting nearer to its new hospital, and hopes to begin its construction next spring. It will take about three years to complete and will have accommodation for 200 patients, but will be designed so that an additional 200 beds can be added as need arises.

J. H. MACDERMOT

ALBERTA

On October 15, Dr. Edward H. Rynearson, chairman of the section of endocrinology, the Mayo Clinic, delivered the first annual lecture of the Alpha Alberta Chapter of Alpha Omega Alpha Honour Medical Society. His subject was "Clinical aspects of anterior pituitary hormones". Admission was by invitation, these having been mailed to the doctors of the province.

The award of a research grant of $1670 to Dr. J. D. Taylor, University of Alberta, has been announced by the Multiple Sclerosis Society of Canada. The Multiple Sclerosis Society of New York has provided a grant of $10,000 to Dr. E. Thackeray Pritchard, assistant professor of biochemistry in the same institution.

Dr. H. E. Rawlinson, who has been with the department of anatomy, University of Alberta, for the past 24 years, has been appointed head of the department. He succeeds Dr. R. F. Shaner. Dr. Rawlinson is at present serving his second term as president of the National Cancer Institute.

Dr. John P. Hubbard, professor of public health and preventive medicine at the University of Pennsylvania, recently addressed the Northern Alberta division of the Canadian Public Health Association on new trends in medical education in the United States.

Dr. Cynthia A. Stoltze of Lethbridge, an assistant to the staff of the Mayo Clinic in internal medicine, was given the Judson Daland Award for educational travel, for her "excellence of general work and for a study of Sjögren's syndrome", during the 35th annual meeting of the Alumni Association of the Mayo Foundation in Rochester, Minnesota, October 8-10.

Two new appointments to the staff of the University of Alberta Medical School and the University of Alberta Hospital have been announced. Dr. Harold Barker has been appointed assistant professor of psychiatry, and Dr. Herbert Pascoe has been appointed clinical instructor in psychiatry. Both men received their postgraduate training in psychiatry in the province of Ontario and the University of Toronto.

Dr. Barker, a native of Winnipeg, graduated in medicine from the University of Western Ontario (London), and after his formal postgraduate training in psychiatry, completed two further years of study in child psychiatry at the Children's Service Center of Wyoming Valley in Wilkes-Barre, Pennsylvania, before taking up his post in Edmonton. He is director of the department of psychiatry's new unit for emotionally disturbed children.

Dr. Pascoe, a native of Toronto, was on the medical staff of the Ontario Hospital in St. Thomas before assuming his new position.

W. B. PARSONS

SASKATCHEWAN

Ross Thatcher, provincial leader of the Liberal party in Saskatchewan, stated that the Liberal party in this province, if elected, would introduce a "voluntary type medical care plan which would represent a private enterprise undertaking". The Liberal provincial executive met recently to iron out the preliminary details of

"this major plank in the party's platform". Mr. Thatcher said that the Liberal party's medical care plan would "take the whole issue out of the realm of politics". "The doctors in Saskatchewan have flatly refused to have any part of a socialized medical care plan which would make them civil servants, but I think they will co-operate with ours," he said. If a socialized medical care plan were introduced in Saskatchewan, Mr. Thatcher predicted that there would be a general exodus of the medical men from the province. He also said that a socialized medical plan would not have the same advantages as the proposed Liberal scheme.

Mr. Thatcher pointed out that there would have to be province-wide participation in the plan for it to be a success, but the people would first be given a chance to decide by means of plebiscite the desirability of the plan. They would be given factual information regarding estimated costs. The majority vote would decide whether the scheme was adopted or not. The Liberal plan would provide a free choice of doctor which a socialized scheme would not, Mr. Thatcher said. Under the plan, the doctors in the province would be remunerated on a fee-for-service basis. He indicated that there would be no change in the present hospitalization plan, and the medical care schemes would be simply an addition to the whole enterprise financed primarily, though not necessarily completely, by direct charge.

Mr. Thatcher visualized the plan as all-embracing and administered by a board with representatives from government, the medical profession and the public. Government would have majority representation on the board which would be responsible to the Minister of Public Health in the legislature. The board administering the plan would of necessity be experts who would study all phases of the plan and set the fees for public participation and decide the amount of remuneration for doctors. He said that special studies would be undertaken to provide medical care to certain groups such as elderly people with small means and persons suffering from chronic illness. If the people vote for the Liberal party, no one in the province will be left out, Mr. Thatcher said. (Reference: *Leader Post*, Friday, October 9, 1959.)

Dr. J. A. H. Lee of the Social Medicine Research Unit, Medical Research Council, London, England, visited Saskatoon in the latter part of September. While here he spoke at the University of Saskatchewan on "Recent studies in the epidemiology of non-infectious disease".

Official opening ceremonies of the new Victoria Hospital wing were held on October 9. The Hon. J. Waldo Monteith, Federal Health and Welfare Minister, and the Provincial Health Minister, the Hon. J. Walter Erb, were in attendance.

The University of Saskatchewan has established a correspondence course in Hospital Administration designed to aid the administrators of small hospitals. This endeavour is regarded as an experiment and could lead to the establishment of similar programs elsewhere. At the College of Commerce it will be under the direction of Dean T. H. McLeod. The program is made possible by the promise of a grant of $30,305 from the W. K. Kellogg Foundation over a three-year period. The Saskatchewan Hospital Association will also provide some funds. Persons enrolling will receive 26 study assignments via correspondence each year and attend two types of intensive short courses: one of two or three days' duration in a selected community, and the other of ten days to two weeks' duration at the University.

Fifty-five Saskatchewan doctors were in attendance at the Fifth Annual Convention of the Saskatchewan Branch of the College of General Practice of Canada held at the Hotel Saskatchewan in Regina. Guest lecturers were Drs. P. Thorlakson of Winnipeg, C. Crosby of Regina, I. M. Hilliard of Saskatoon, and A. M. Edwards of Edmonton. G. W. PEACOCK

MANITOBA

The annual meeting of the Manitoba Division, Canadian Medical Association, was held in the Royal Alexandra Hotel, Winnipeg, on October 5-8. It was well attended, for the president, Dr. Edward Johnson, and his faithful executive had prepared a worth-while program of addresses and exhibits. Dr. E. Kirk Lyon, Deputy to the C.M.A. President, and the guest speakers, Dr. W. G. Bigelow, Toronto, Mr. Leo Brown, American Medical Association, Dr. E. F. Crutchlow, Montreal, Dr. B. L. Hession, London, Ontario, Dr. R. G. Siekert, Rochester, Minnesota, and Dr. T. A. Watson, Saskatoon, added much to the success of the meeting.

The scientific exhibit was large and worthy of its name. It indicated something of the considerable amount of research work being done in Manitoba.

For the first time the Medical Library had a display and it attracted much attention. The Hollenberg family has donated $2000 to the Library in memory of the late Dr. A. Hollenberg. The gift will be a special fund to provide reference books for undergraduates.

The Manitoba Medico-Legal Society began the 1959-60 season on October 27 with a discussion on whiplash injuries. Subjects to be presented later are: Recent developments concerning the criteria of sex, and possible legal implications; The Dr. Buck Ruxton murder case; Liability for malpractice and professional negligence; and Medical and legal aspects of autopsies.

Dr. E. L. Ross, medical director of Manitoba Sanatorium Board, and Dr. A. L. Paine, medical superintendent of Manitoba Sanatorium, Ninette, recently visited the annual Pembine Therapy Conference in Pembine, Wisconsin. The conference includes Michigan, Wisconsin and Minnesota. For the first time a Canadian, in the person of Dr. Paine, presented a paper before the conference. It dealt with the way in which 15 consecutive cases admitted to Manitoba Sanatorium since January 1958 were handled from diagnosis through treatment to discharge.

Dr. Lawrence Irving, director of physiological research, Arctic Health Centre, Anchorage, Alaska, addressed professors and students at the Medical College on September 24. He said that his studies indicate that people can adapt to cold climates quickly. Eskimos, Laplanders, some Norwegian groups and Australian aborigines display ability to withstand cold temperatures. He believes that his work may eventually

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tie in with studies in surgery under lowered body temperatures.

A committee headed by Rt. Rev. Basil Kushnir, vicar-general of the Ukrainian Catholic archdiocese of Manitoba, and including three Winnipeg aldermen and Drs. B. Dyma, R. J. Cleave, C. S. Herschfield and F. A. Rybak, is making plans for a $2.5 million, 500-bed hospital in North Winnipeg, at present without a hospital. It will be operated by the Servants of Our Lady, an order of nuns. It is hoped to acquire the 3½-acre site of the McGregor Armories grounds.

Dr. Paul B. Hagen has been named professor and head of the biochemistry department in the University of Manitoba. Dr. Murray Judson Fraser will be assistant professor.

Professor Hagen is a native of Sydney, Australia, and a graduate of the University of Sydney (1945); he has taught pharmacology at Yale University School of Medicine and at Harvard. For the past year he has also been director of the U.S. Public Health Service graduate and postgraduate training program in pharmacology at Harvard Medical School.

Dr. Fraser, a native of Yarmouth, N.S., has a B.Sc. (honours) degree in physical chemistry and an M.Sc. degree from Dalhousie University and a Ph.D. from Cambridge University. He has demonstrated in physical chemistry at Dalhousie and in colloid science at Cambridge University.

Dr. Leon Michaels, recently of the cardiac department, Guy's Hospital, London, and the Mayo Clinic, has joined the Manitoba Clinic at Winnipeg.

The City of St. James has offered to build a new general hospital on a 20-acre site on the north side of Portage Avenue and bounded by Lakeview, Victoria and Bruce Streets. It is proposed by the city that the Salvation Army take over and run the new hospital as Grace Hospital. The greater part of the present Grace Hospital is outmoded and the present site does not permit expansion. The offer is under consideration.

Dr. J. H. Kellgren, professor of rheumatology, University of Manchester, gave an address in the Medical Auditorium, Winnipeg, on October 20 on "Differential diagnosis of polyarthritis". On the morning of that day he conducted ward rounds in the Winnipeg General Hospital.

Manitoba doctors congratulate Dr. Howard Reed, department of ophthalmology, University of Manitoba, on the publication of his book "The Essentials of Perimetry" by the Oxford University Press.

Dr. John C. Graham has opened an office at 428 Medical Arts Building, Winnipeg, for the practice of thoracic and cardiovascular surgery.

ROSS MITCHELL

ONTARIO

Dr. Frank B. Walsh, professor of ophthalmology, Johns Hopkins University, Baltimore, Maryland, delivered the second University of Toronto Walter W. Wright Lecture in Ophthalmology at the Academy of Medicine on October 23, 1959.

Dr. Walsh is one of the leading eye physicians in the United States and author of a textbook in clinical neuro-ophthalmology widely used all over the world. He spoke on "Trauma to the skull and certain ocular findings".

The Walter W. Wright Lectureship in Ophthalmology was established a year ago in honour of Dr. Walter W. Wright, professor emeritus of ophthalmology, University of Toronto.

The Annual Clinic Day of the Ontario Branch of the College of General Practice of Canada will be held in Kitchener at the Mutual Life Auditorium on April 6, 1960.

QUEBEC

Rev. Dr. Noël Mailloux, 49, director of the Human Relations Research Centre in Montreal, has been awarded a substantial grant from the National Research Fund of the Canadian Mental Health Association, for his study of the personality of delinquent boys with a view to improving treatment of young people in custody. His work on the delinquent's attitude towards parents, school, work and money, judicial institutions, police and correctional institutions already appears to be of considerable importance. The research grant will make it possible for Dr. Mailloux to devote practically full time to these researches on delinquency during the next four years. Under the terms of the grant he is encouraged to exercise "creative freedom", which means simply that he is free to explore any promising scientific leads as they may develop in the course of his investigations.

THE COLLEGE OF PHYSICIANS AND SURGEONS OF THE PROVINCE OF QUEBEC

The Provincial Board of the College held a regular meeting on September 30, 1959.

The financial statement for the fiscal year 1958-59 was discussed and approved.

It was announced that the draft of the new Medical Act will definitely be presented to the Quebec legislature this coming session. Many medical groups have asked that this draft be first studied by all the leading societies before its presentation for approval. The Board feels however that this would bring unnecessary discussions and delays on a subject which has been under scrutiny for nearly four years.

Dr. Rioux suggested that medical students registered with the College who for various reasons have chosen to pursue their studies outside this province should be allowed to take yearly examinations before our own examiners instead of awaiting the completion of their studies to take them all at one time. The board fully concurred with this excellent suggestion.

Dr. Lemieux has asked that Colleges in other provinces be advised of our endeavour to obtain from the Federal Government some restriction to the sale of diagnostic x-ray equipment to anyone but hospitals and medical practitioners; it is hoped that we may obtain their co-operation in this matter so important to public health.

One of the amendments to the Medical Act, if adopted, will allow the College to give grants to universities for postgraduate teaching and to help defray expenses of lecturers at clinical meetings held by hospitals. At present, we are allowed to help medical societies only.

Many other topics of interest were discussed during the meeting, which adjourned at 8 p.m.

NEW BRUNSWICK

The New Brunswick branch of the Defence Medical Association, at a dinner meeting in Saint John, received reports of the annual meeting of the Association in Ottawa presented by Dr. G. E. Maddison, the New Brunswick delegate. Dr. A. F. Chaisson of Fredericton was chairman and Lt.-Col. J. Feindel, Area Medical Officer, Canadian Army Headquarters at Fredericton, was guest speaker. Officers elected for 1959-60 are: honorary president, Dr. V. D. Davidson; president, Dr. Arthur F. Chaisson; vice-president, Dr. Frederick George; secretary-treasurer, Dr. R. J. Brown.

Dr. A. F. Torrie of Fredericton, accompanied by a physiotherapist from the Fredericton Polio Clinic, a technician to fit braces and orthopædic shoes, and a large group of public health nurses, examined, registered and advised care for 102 crippled children at the annual clinic at Newcastle.

Dr. Robert P. McCombs of the Pratt Diagnostic Clinic, New England Cancer Hospital, and professor of graduate medicine, Tufts College, addressed the Saint John Medical Society on October 15 in the Pathology Auditorium on "The management of bronchial asthma and pulmonary emphysema". Dr. McCombs speaks as a clinician and with authority. His audience enjoyed an evening of interest in a very practical discussion of a problem present in everyday practice. On the same day our visitor joined with the Saint John thoracic group in a clinical program at the Saint John Tuberculosis Hospital in the morning and after lunch assisted in the discussion of a paper by Dr. R. F. LeBlanc on "Pulmonary metastases resembling diffuse lesions of the lung", and another by Dr. W. D. Miller—"Pulmonary arthropathy".

Hospital insurance, which came into force in New Brunswick in July, is presenting many problems which are receiving attention and study by the commission, the Medical Advisory Committee and the Executive Committee of the New Brunswick Medical Society. Among these questions, the reasonable use of drugs by physicians is of great importance because so far the commission has allowed free choice of drugs. It has been pointed out that the use of antibiotics and tranquillizers presents a difficulty, in that many drug companies put out the same drug under different names. Doctors are requested to use the preparation chosen by hospital pharmacies because it is impossible and impractical to stock them all.

Two other problems are out-of-province referrals and out-patient services. In none of these has a final decision been made but study is progressing in an atmosphere of fair and open-minded compromise.

A. S. KIRKLAND

NOVA SCOTIA

The semi-annual meeting of the Halifax Medical Society was held on October 14 at the Lord Nelson Hotel. More than one hundred doctors attended the dinner meeting, which was chaired by the President, Dr. John Merritt. The dinner speaker was Dr. George Grant, professor of philosophy at Dalhousie University.

During his address, Dr. Grant stated that in his opinion during the last half century the medical profession had recreated itself, and had focused its attention on scientific traditions while losing most of the traditions with which it had been identified for centuries. While the medical profession had been wallowing around in a sea of technical traditions, the legal profession had kept secure its participation in traditions and its deep sense of responsibility of human meanings.

Many of the problems facing the world today are economic ones, but once these problems have been solved—and they are bound to be solved before too long—society will be faced with moral, political and religious problems that depend on the quality of an individual's mind. To solve these problems, assistance will be sorely needed from both the legal and the medical professions, Dr. Grant said, but to give it, members of the medical profession must change their present attitudes. Dr. Grant offered no solution.

Judge F. H. Patterson of the Nova Scotia Supreme Court has criticized the Victoria General Hospital in Halifax for permitting doctors other than the patient's personal physician to examine the patient's x-ray films. Judge Patterson, hearing a case for damages arising from a motor vehicle accident last year, expressed surprise that once an x-ray picture is taken at the Victoria General Hospital, or in fact anywhere, this film may be shown to any medical man to examine on his own motion.

"For reasons that are self-evident, persons who consult a medical man have the right to the positive assurance that their communications to him are private," Judge Patterson said. Judge Patterson also said that evidence showed that a surgeon called as an expert witness at a trial had examined x-ray plates of a patient's injuries taken at the Victoria General Hospital. This had been done without her consent or knowledge, he said.

Dr. C. M. Bethune, Administrator of the Victoria General Hospital, issued the following statement: "The Victoria General Hospital keeps on active file some 160,000 x-ray examinations and has many more thousands of examinations in inactive storage. These films are immediately available on the request of a physician. When a physician wishes to see films of patients who are not in his care, it is our practice to obtain the written consent of the patient, the patient's physician, the patient's attorney, or the courts."

It is your correspondent's opinion that Judge Patterson's criticism has placed the medical profession of this province in an embarrassing position, perhaps unnecessarily so. One is compelled to ask the question "What are we to do about public ward patients' x-ray films? Such films are seen by many doctors and by third- and fourth-year students alike. Are we doing something which is wrong, or are we covered in every respect by the slip of paper which the patient signs when he or she is admitted to our care?" Perhaps this

pertinent matter will be discussed by the executive of the Nova Scotia Medical Society. WALTER K. HOUSE

NEWFOUNDLAND

ANNUAL CONVENTION OF N.M.A.

The annual convention of the Newfoundland Medical Association took place in fine weather, May 21 to 23, and proved to be enjoyable and stimulating. There was a scientific program of high calibre featuring chiefly visiting experts, including Drs. George White of Saint John, N.B., C. L. Gosse and R. C. Dickson of Halifax, of the C.M.A. "team"; Dr. Paul Woolley, Jr., of Detroit and Dr. D. R. Wilson of Toronto.

The President of the C.M.A., Dr. VanWart, delivered the Presidential Address, and luncheon meetings featured talks by Dr. A. D. Kelly and Mr. B. E. Freamo of the central office of the C.M.A. Dr. Kelly spoke on the topic "Public relations in medicine". He stressed the need for "deeds, not words"; he felt that the profession was judged on its performance, individually and collectively, and that continuous self-criticism was the key to favourable public opinion.

The newly elected N.M.A. Executive for 1959-60 are as follows: president, Dr. J. W. Heath, Bonavista; first vice-president, Dr. F. L. O'Dea, St. John's; second vice-president, Dr. J. H. King, Corner Brook; immediate past president, Dr. J. B. Roberts, St. John's; secretary, Dr. C. U. Henderson, St. John's; treasurer, Dr. J. D. Baird, St. John's; members: Drs. C. J. Joy, C. H. Pottle, I. E. Rusted and J. G. Williams, St. John's; W. P. Collingwood, Placentia; D. P. Murphy, Stephenville; A. T. Rowe, Carbonear; and H. M. Twomey, Botwood.

ST. JOHN'S CLINICAL SOCIETY

The Executive of the St. John's Clinical Society have laid plans for a full year of scientific, social and economic activity, beginning with a dinner at the Bally Haly Golf Club on October 7. The scientific portion of the program consisted of a discussion of the recent severe poliomyelitis epidemic, led off by Dr. J. W. Davies, Chief Medical Health Officer.

Other events for this year are a Refresher Course on November 2 and 3, a clinical session at Pepperell Air Force Base in February, and in April a joint meeting with the Law Society for a symposium on "Medicine and the Law". On the business side, the society will act as a continuing forum for medical opinion, particularly in regard to medico-political matters.

The executive for this year are: president, Dr. A. R. Mercer; vice-president, Dr. J. B. Ross; secretary-treasurer, Dr. J. F. Collins; members, Drs. A. S. Lewis and G. H. Flight.

The Newsletter of the Newfoundland Medical Association has started its second year of publication. It fills a great need in this province where the members of the profession are widely scattered geographically. It is planned to put out six issues this fall and spring, and there may be some change in format to accommodate advertisers.

Dr. Charles Cron has recently been the recipient of congratulation from his friends inside and outside the profession on the occasion of his Golden Jubilee in medicine. Dr. Cron graduated from McGill University in 1909 and has spent the greater number of the 50 years in general practice at Harbour Grace, about 50 miles from St. John's. The people of Harbour Grace, at a public gathering recently, expressed their appreciation for his "untiring and loyal service" and their wish for many years more. This is the wish of his medical colleagues too. A. J. NEARY

ABSTRACTS *from current literature*

MEDICINE

Arteriovenous Fistula of the Lung.

R. E. FOLEY AND D. P. BOYD: *Dis. Chest*, 35: 422, 1959.

Arteriovenous fistula or aneurysm of the lung is a congenital shunt between arteries and veins in the lung. With the increased use of angiocardiography, the condition is being recognized more and more readily. In the majority of cases the shunt is from a pulmonary artery branch to a pulmonary vein tributary.

The diagnosis is suggested by cyanosis and clubbing of the fingers and toes, together with a rounded or lobulated density in the lung roentgenograms. The cyanosis may reach extreme degrees, depending upon the amount of arterial oxygen unsaturation and hæmoglobin value. Telangiectases on the skin or visible mucous membranes are found in more than half of the cases, since this disease is part of the complex known as hereditary hæmorrhagic telangiectasia. In the cases with severe cyanosis, variable neurological symptoms may be present. A bruit is present in 50% of the cases and is heard over the site of the fistula.

Angiocardiography is the best method for demonstrating the vascular nature of the lesion in the lung. The dye will concentrate in the aneurysm one or two seconds after it reaches the right atrium.

The pulmonary arteriovenous fistula with its aneurysm should be removed unless the surgical risk is prohibitive because of some other unrelated condition. Usually, removal can be accomplished by lobectomy.

S. J. SHANE

Salmonella choleræ-suis Meningitis: Cure after Surgical Excision of an Infected Subarachnoid Cyst.

J. FITZGERALD, M. J. SNYDER AND R. T. SINGLETON: *Ann. Int. Med.*, 50: 1045, 1959.

The therapeutic efficacy of chloramphenicol in *Salmonella typhi* infection has been demonstrated by numerous investigators, and its value in other salmonella infections has also been reported.

The case of *Salmonella choleræ-suis* meningitis reported is of considerable practical interest, since levels of chloramphenicol in the blood and cerebrospinal fluid exceeding the minimal inhibitory concentration levels for this organism failed to control the infection. This emphasizes the fact that antibiotics do not single-handedly eradicate established focal infections. Basic principles of surgery should play a major role in modern therapeutic regimens. The micro-organism *Salmonella choleræ-suis* has a notorious habit of localization, and this experience serves to stress this point, since the infection produced a subarachnoid cyst.

S. J. SHANE

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(Continued from page 962)

Sex Determination by Blood Smear.

J. M. CALIEZI: *Schweiz. med. Wchnschr.*, 89: 499, 1959.

All methods of sex determination by examination of cells are based on morphological differences of cellular nuclei. In the case of blood corpuscles there is a special situation, as the sex difference in nuclear appearance is related to a chromatin particle adherent to the nucleus. As the particle is subject to a great deal of variation, confusion can occur and opinions vary regarding the significance of one or the other special form. The author describes his own classification of the various forms of nuclei of neutrophil leukocytes, and then outlines the criteria for sex determination based on blood smears. In brief, the criteria for assignment to the female sex consist of a blood picture which contains three specific forms (drumstick or club forms) in 500 or fewer mature neutrophils. For male assignment it is necessary to count at least 300 cells in which no drumstick club or sessile nodule forms are found and tags are frequent. The author discusses briefly the problem of difference between sex determinations based on the oral mucosa and on the blood smear. Whilst probably the majority of such cases are due to faulty technique, he himself has seen three patients in whom the oral mucosa indicated the presence of Klinefelter syndrome and in whom it was impossible to make a definite sex determination. A detailed description of the method of staining and of examination of blood smears is given. Photomicrographs of the different nuclear forms serve to illustrate the text.

W. GROBIN

Epidemic of Histoplasmosis in a Family.

G. R. MINOR AND J. H. COREY, JR.: *Dis. Chest*, 35: 409, 1959.

An "epidemic" of histoplasmosis results when several persons become ill from generalization of a pulmonary infection incurred by simultaneous inhalation of dust containing the organism, *Histoplasma capsulatum*. A number of such epidemics have been reported, involving almost 400 persons. For the most part these have occurred in the endemic area of central United States. The authors report an epidemic in a family from northern Virginia consisting of young parents and four children five to 11 years of age who were exposed at the same time to the dust raised during the cleaning of a chicken house. In 10 to 12 days they became variably ill with fever, malaise, non-productive cough, irritability, weakness, nausea, anorexia and headache.

Roentgenograms of the chest showed lesions in all, proportional to the degree of exposure and comparable to the severity of the symptoms. The only significant physical abnormalities were mild generalized adenopathy in the children and palpable liver in the father. The skin tests and complement fixation tests were positive in all six members of the family. Cultures of blood and marrow in the mother and children were negative for *H. capsulatum*, but this organism was ultimately recovered on culture from a specimen of the guano from the floor of the chicken house. The illness lasted about six weeks. The roentgenograms showed a tendency to improvement, but the family, who are migrants, have not been heard from for some months.

S. J. SHANE

SURGERY

Traumatic Ventricular Septal Defect.

G. S. CAMPBELL *et al.*: *J. Thoracic Surg.*, 37: 496, 1959.

In two cases, a traumatic ventricular septal defect resulted from an automobile accident. In the first case, the patient showed rather marked pulmonary hypertension with a large left-to-right shunt. He was in obvious cardiac failure, so surgical closure of this defect was carried out. Postoperatively the patient has done very well although a small left-to-right shunt is still present. In retrospect, it is thought that because these multiple defects had very rigid and scarred margins (completely unlike the congenital lesions), some spacefilling substance such as compressed polyvinyl sponge should have been placed (as would be done now) between the defect margins to stimulate deposition of connective tissue. However, the fact that the pulmonary pressures had returned to normal within five months after operation is ample indication that the residual leak was small and may close subsequently by deposition of fibrin. As three years have elapsed since the operation, a second postoperative catheterization is planned to test this thesis.

The second case is interesting in that the left-to-right shunt and the pulmonary artery pressure have remained at approximately the same levels as reflected by cardiac catheterization studies done 5½ years apart.

S. J. SHANE

Angiosarcoma in Post-mastectomy Lymphœdema.

E. M. MCCONNELL AND P. HASLAM: *Brit. J. Surg.*, 46: 322, 1959.

Five more cases of angiosarcoma occurring in the lymphœdematous arm after radical mastectomy are here added to the 23 cases reported since 1948. The stories are similar to those previously recorded: mastectomy for carcinoma of the breast with or without irradiation followed by œdema of the arm but apparent cure of the cancer for a long period, then the appearance of a new neoplastic lesion in the swollen arm which the patient usually calls a bruise.

It seems likely that the complication is more common than reported, for it is often considered a recurrence of the breast carcinoma, though the period between averages 10 years. The influence of radiotherapy is hard to assess, but all five of these patients had radiotherapy, and the incidence of lymphœdema of the arm is greater when radiotherapy is added to radical mastectomy.

The prognosis of this angiosarcoma is very poor, for metastases to the lung occur early. In all these cases there was malignant proliferation of lymphatics, especially about small blood vessels in the lower dermis and subcutaneous tissue. It is suggested that there is a pre-malignant angiomatosis giving the appearance of bruising before the frankly malignant lymphangiosarcoma. Considering the reported cases of angiosarcoma occurring in limbs which were œdematous for long periods but not associated with a previous malignancy, it seems that the malignant change is somehow related to the œdema rather than the previous cancer.

Treatment by either amputation or radiotherapy is difficult to assess.

BURNS PLEWES

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Disruption of Muscles and Tendons.
S. H. ANZEL *et al.*: *Surgery*, 45: 406, 1959.

This article is based on 1014 cases seen at the Mayo Clinic; 598 disruptions were due to lacerations and 416 due to other causes. Sixty-four per cent of all were associated with fractures. Of the total disruptions, 269 were incomplete, and most of the shoulder-cuff injuries were in this group. Injuries were classified as follows: (1) lacerating injuries; (2) direct injury; (3) stress rupture; (4) miscellaneous.

The upper limb was injured six times more frequently than the lower limb. The finger flexors, followed by the extensors, the shoulder cuff, and the biceps tendon accounted for 76% of the disruptions in the arm. In the lower limb the list was headed by the quadriceps, followed by the Achilles tendon and the triceps suræ. These lesions comprised 67.8% of the lower limb defects.

McMaster's classical experiments on tendon rupture are discussed. Further papers are to follow on why these tendons rupture, what can be done to prevent rupture, and how they can best be treated.

T. A. MCLENNAN

A Technique for Subtotal Excision of the Trachea and Establishment of a Sternal Tracheostomy.
W. R. WADDELL AND B. CANNON: *Ann. Surg.*, 149: 1, 1959.

A method of reconstruction after resection of the trachea for malignant tumours when end-to-end anastomosis cannot be accomplished is presented, for none of the previously described techniques are quite satisfactory in providing a tubular conduit that is air-tight and will not collapse. The incision provides for skin flaps from the chest wall from which a tube can be fashioned to be anastomosed to the cut end of the trachea through a hole made in the sternum. After an extensive tracheal resection, a skin-lined tracheostomy is thus established around the aorta through the anterior mediastinum.

The use of this procedure in four cases is described.

BURNS PLEWES

Techniques of Porto-caval Shunt. Renal-portal Vein Anastomosis *(in French)*.
G. EPOSITO, A. INFRANZI AND F. PORTOLANO: *Lyon Chir.*, 55: 14, 1959.

A simple variation of porto-caval anastomosis is described utilizing the right renal vein and suturing it end-to-side to the portal vein. In some cases a vascular graft was used between these structures. The experiments were carried out on 10 dogs and the results were poor—only four of the shunts remaining permeable over a period of from 2 to 60 days. The results in all cases were confirmed by venography and post-mortem study. Because the portal vein is mobile in the dog, the left renal vein can also be used. The insertion of a graft allows preservation of the kidney.

The following shunt techniques are in use today: (1) Side-to-side porto-caval shunt; (2) end-to-side porto-caval shunt; (3) end-to-side spleno-renal shunt; (4) end-to-end spleno-renal shunt; (5) superior mesenteric vein to vena cava (Bogoraz); (6) inferior mesenteric vein and spermatic vein (Beer); (7) inferior mesenteric vein and left iliac vein; (8) superior mesenteric vein and ovarian vein (Villard and Tavernier); (9) right gastro-epiploic vein and left renal vein (De Britto); (10) branches of inferior mesenteric vein and branches of renal vein (Léger).

This new method adds an alternative technique. In this method the right renal vein is clamped with a Blalock clamp and sectioned as close to the kidney as possible. The vena cava is partly clamped, incised and the anastomosis made; 0000 silk everting (Blalock) sutures are used. Antibiotics are used routinely. There is as much danger of bleeding with heparin as there is of thrombosis without it.

[The use of a graft seems unnecessary. If it is used, it would be possible to anastomose portal vein directly to the inferior vena cava, and thus obviate damage to the renal vein. The number of cases in which this alternative technique could be used must be very small.]

T. A. MCLENNAN

THERAPEUTICS

Beclamide in Intractable Epilepsy: A Controlled Trial.
J. WILSON, J. N. WALTON AND D. J. NEWELL: *Brit. M. J.*, 1: 1275, 1959.

Beclamide (Nydrane; Hibicon; n-benzyl-β-chloropropionamide) is structurally quite different from the conventional anticonvulsants, and is relatively non-toxic in therapeutic doses. Of 16 patients whose attacks were uncontrolled despite large doses of the common anticonvulsants in different combinations, 13 were considered suitable for the trial with this new drug. A statistically controlled double-blind trial was carried out on the patients who all suffered from major or temporal lobe epilepsy and it was found that in a dosage of 3 g. daily this drug was more efficient than a placebo in reducing the number of seizures. Nine out of 13 patients showed a reduction in the overall frequency of seizures to 75% of the previous figure. The trial on the 3-g. dose lasted for six months and at the end of this period a further trial of 4-8 weeks on 4 g. daily was made on the patients who were still relatively uncontrolled. No evidence of toxicity was observed and no greater benefit from the larger dose was obtained than from the smaller dose. Although the authors believe that beclamide has a place in the management of major or temporal lobe epilepsy, its high price and large size of tablets, as well as the relative lack of efficiency, will limit its use to the cases whose attacks are poorly controlled by the more conventional anticonvulsants. No evidence of incompatibility with other anticonvulsants was observed.

W. GROBIN

Antibiotics other than Penicillin in Treatment of Syphilis.
C. H. MONTGOMERY AND J. M. KNOX: *New England J. Med.*, 261: 277, 1959.

The increasing frequency of penicillin sensitivity has created a need for information on the use of other antibiotics for the treatment of syphilis. The literature on the subject is reviewed. Although penicillin is undoubtedly superior to any of the other known antibiotics, several satisfactory substitutes are now available.

Chlortetracycline, chloramphenicol, oxytetracycline and possibly tetracycline are effective in dosages as low as 30 g. if given over at least an eight-day period. Carbomycin and erythromycin in a 20-g. dose are effective over the same period.

NORMAN S. SKINNER

(Continued on page 968)

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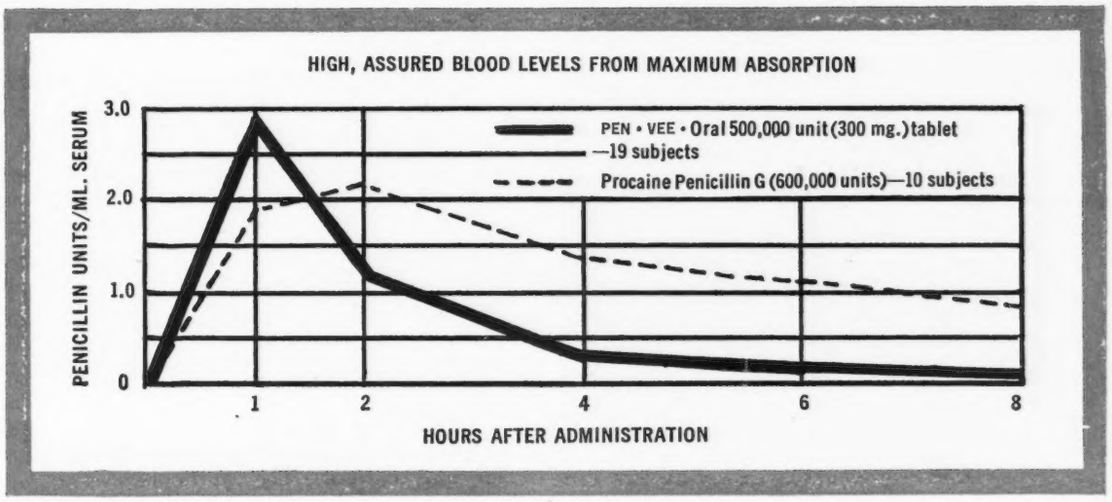

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(Continued from page (966))

OBSTETRICS AND GYNÆCOLOGY

Blood Loss in Vaginal Surgery: A Comparative Study.
M. R. LAZAR AND H. A. KRIEGER: *Obst. & Gynec.*, 13: 707, 1959.

Blood loss in 170 consecutive vaginal operations was determined gravimetrically. The multiple-site infiltration technique using dilute epinephrine was employed in 47 vaginal hysterectomies. The average blood loss was 314 c.c. In the non-infiltrated cases the average blood loss was 755 c.c. In 57 anterior and posterior plastic repairs, of which 37 were infiltrated, the non-infiltrated group averaged 305 c.c. blood loss, the infiltrated group 189 c.c. With the Manchester operation, the infiltrated group had an average blood loss of 198 c.c., and the non-infiltrated group an average loss of 578 c.c. Time of operation was less in the infiltrated cases. No significant increase in morbidity or mortality could be attributed to either surgical technique.

The gravimetric method is valuable, practical and accurate for determining blood loss and the need for blood replacement during surgery. ROSS MITCHELL

PÆDIATRICS

Prevention of Pulmonary Complications in Infants with Tracheotomy.
A. WINTER AND E. GILMORE: *New England J. Med.*, 261: 482, 1959.

A tracheotomy cannula which is too long may enter the right main-stem bronchus, lead to obstruction of the left main-stem bronchus and be the unrecognized cause of serious complications and even a fatal outcome in patients who have been subjected to tracheotomy. Tracheotomy cannulas are usually marked for use in a child of a certain age. This does not take into account the child's development. In a child or infant smaller than average, such a cannula may be too long for safe use.

This paper presents examples where complications arose from the use of cannulas which were too long for the patient. The authors recommend that the position of the carina be determined by x-ray examination before tracheotomy is performed, unless this is precluded by the emergency nature of the operation. The position of the cannula should be carefully checked by x-ray examination as soon as possible after tracheotomy. NORMAN S. SKINNER

DERMATOLOGY

Herpes Zoster Involving the Urinary Bladder.
R. MEYER, H. P. BROWN AND J. H. HARRISON: *New England J. Med.*, 260: 1062, 1959.

Two cases of urinary retention secondary to herpes zoster involving the 2nd to 5th sacral dermatomes are reported. One had two vesicular lesions on the left ureteric ridge that progressed to a severe hæmorrhagic and exudative cystitis. The second case had a non-specific chronic cystitis on the 52nd day of the disease. The parasympathetic fibres innervating the bladder arise from 2nd to 4th sacral segments, and the cystitis observed in these cases was presumably due to irritation of these segments. ROBERT JACKSON

BOOK REVIEWS

PANCREATITIS. A Clinical-Pathologic Correlation. Herman T. Blumenthal and J. G. Probstein. 379 pp. Illust. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1959. $10.50.

Abdominal surgery has made such great advances in recent years that many of the affections of the gastrointestinal tract now have broadly defined concepts of treatment and to a lesser extent of etiology. Diseases of the pancreas, however, still present many puzzling features in causation, physiological effects and management. Acute and chronic pancreatitis are examples of these diseases.

It was because of this that the reviewer found this epitome of present-day knowledge of this disease educational reading. Though the book is full of interesting and useful information, it was a little difficult to read because the authors, in an effort to be thorough, are at times repetitious and plodding. Despite this fault the monograph abounds with information and references. There is a summary at the end of each of the five parts of the book providing a condensation and a judgment made on all that went before.

The last part, on treatment, was less exhaustive than the others upon etiology, pathology, physiology, and clinical manifestations, but offers an overall view, with references for those who seek detail.

This is a valuable source book for the general surgeon and gastroenterologist.

THE ECOLOGY OF THE MEDICAL STUDENT. Edited by Helen Hofer Gee and Robert J. Glaser. 262 pp. Illust. Association of American Medical Colleges, Evanston, Ill., 1958. $2.00.

This collection is taken from papers presented at the Fifth Teaching Institute of the Association of American Medical Colleges which took place in October 1957 in New Jersey. Participants came from 99 medical schools ranging from the United States, Puerto Rico and Canada to Britain.

The contents are divided into four parts. Part I deals with the characteristics of medical schools and medical students. The aims of the medical schools are covered and also the aims of the medical students. Where these are at variance, the reasons for this divergence is sought. The reasons for the choice of career are also investigated. In this chapter, attempts are made to assess student attitudes and changes in these during progress through medical training.

In Part II, external factors affecting the medical student are considered. These include the intellectual environment and the methods by which the student learns the art and science of medicine. The role and desirability of student counsellors are considered. Part III is concerned with sociological contributions to the study of the medical student, and Part IV with educational patterns in medicine. New and novel methods of medical education are described, compared and contrasted with more traditional methods.

Finally, a paper on British methods of medical education is presented. This deals mostly with the methods employed in the London hospitals, where the number of students is relatively small and medical material and teaching staff are abundant.

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NOURISHING BRAIN CELLS. C. E. Lumsden. 22 pp. Leeds University Press, Leeds, England, 1959. 2s. 6d.

After graceful references to his predecessors—Matthew Stewart and R. A. Willis—in the chair of pathology in Leeds, the author gives a fascinating sketch of one phase of the brilliant research work on which he has been engaged for some years.

By a combination of tissue culture, histological and electron-microscopic studies of neuroglia he has come to the conclusion that these cells are responsible for the nutrition of brain tissue. The oligodendroglial cell is particularly concerned with the elaboration of the materials necessary for the maintenance of the myelin for the medullary sheaths of the nerve fibres. The astrocytes, through the attachment of their processes to the walls of the small blood vessels, have, he believes, the function of extraction of nutritive fluids from the blood stream for utilization by the nervous tissues. This "fluid-drinking", which he has observed in the processes of astrocytes, he calls "pinocytosis".

This "new" function of the astrocyte, in addition to its generally recognized function as a connective tissue of the nervous system, is a very important conception. The author's further studies will be watched with great interest.

RESEARCH ON NOVOCAIN THERAPY IN OLD AGE. Anna Aslan, C. M. Buerger and U. Koehler. 57 pp. Illust. Consultants Bureau Inc., New York, 1959. $12.50.

This translation of the original work on procaine (Novocain) therapy is very timely. There has been considerable talk and numerous enquiries, particularly from the laity, on this subject. Work with procaine was started by Professor Anna Aslan during the period 1946-1949 in cases of asthma, arthritis and limb embolism. In 1951 at the Institute of Geriatrics, Bucharest, Rumania, she extended the work first to 25 old people suffering from such conditions as hypertension, degenerative joint disease and Parkinson's disease. Up to October 1957 she had treated 5251 patients and analyzed the data in 1442 patients. She claims phenomenal results and even uses the term "rejuvenation". For instance, in progressive arteriosclerosis of the brain she states that there is an improvement in memory, ability to concentrate and perceptibility. She feels that the action of procaine is not only directly on the nervous system but also through a gradual release of para-aminobenzoic acid. She claims that procaine stimulates the sexual glands, adrenal glands and thyroid. Also it has a beneficial effect on the skin in such conditions as senile keratosis and ichthyosis. It will prevent greying of the hair and cause hair to grow in alopecia. Beneficial effects are reported in angina, hypertension and peptic ulcer. In the arthropathies there is improvement in mobility and lessening of the pain. In fact, Dr. Aslan claims a prophylactic and rejuvenating effect on the whole human organism.

Professor Buerger and Professor Schulze (Leipzig) in commenting on Aslan's technique state that there is no valid proof for this contention. Drs. Kohler and Mampel (Halle-Saale) state that with procaine treatment, in the majority of elderly patients there is a remarkable improvement in arteriosclerotic and arthritic complaints, but they indicate that there is a need for further studies along these lines to distinguish more clearly between disease and biological fate. In the appendix are three reports from the Soviet literature on procaine. The main feature of these reports is the fact that injection of procaine causes a leukocytosis without a shift in the pattern of the leukocytes. Para-aminobenzoic acid has a similar effect to procaine in experimental animals in increasing the resistance of the organism to oxygen insufficiency (high altitudes).

It is to be hoped that the translation of these reports into English will bring about a greater interest by our specialists in the various fields of medicine in which Dr. Aslan has claimed such phenomenal results. If her reports are substantiated, we should certainly be using this method of therapy. If, however, the results claimed are not forthcoming, this work will serve as a warning against the use of this widely recommended form of treatment.

VA PROSPECTUS: RESEARCH IN AGING. Veterans Administration, Washington, D.C. 125 pp. Illust. Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., 1959. $1.50.

This small book consists of a collection of papers given at a meeting of the members of the Veterans Administration Advisory Committee for Problems of Aging and their guests in May 1958.

Each speaker discussed what he was doing in his special field to elucidate the nature of the aging process. The speakers considered aging of living tissue in increasing order of complexity from aging of molecules and cells, to organs, individuals and groups. Many interesting facts were brought out and very interesting differences of opinion were revealed in the discussion after each paper.

It was noted that different concepts of aging were held by the members. The investigators of aging in molecules and cells attempted to note consistent changes which could be ascribed to the passage of time. The investigators of aging in organs, individuals or groups discussed abnormalities of structures and disease, or maladaptation to society presumed due to aging because associated with passage of time. This group did not think that aging had taken place unless there was some irreversible change in the organism.

This book gives a glimpse into some of the research going on in the field of aging and brings up many unsolved problems. It does not outline any program for the future, nor does it indicate what is being actually done under the auspices of the Veterans Administration.

DIE GEFAESSARCHITEKTUR DER NIERE (Vascular Architecture of the Kidney). Prof. Dr. A. von Kluegelgen, Anatomic Institute of the University of Freiburg. 111 pp. Illust. Georg Thieme Verlag, Stuttgart, Germany; Intercontinental Medical Book Corporation, New York, 1959.

This book is an anatomical study of the vascular architecture of the dog kidney. Particular emphasis is placed on establishing evidence in favour of what is called the "vascular autonomy" of the kidney or the "auto-regulating mechanism" of the renal circulation based partly on the finding of an efficient system of valves in the tributaries of the renal vein. Other findings, such as the existence of a dual venous drainage of the renal cortex and the absence of an arterial blood supply to the most superficial layer of the renal cortex, are merely reaffirmations of known facts.

(Continued on page 973)

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PRACTICAL OBSTETRICAL PROBLEMS. Ian Donald, Regius Professor of Midwifery, University of Glasgow. 712 pp. Illust. The Year Book Publishers Inc., Chicago, 1959. $11.00.

This book, representing the second edition, in the reviewer's opinion completely fulfils the author's objective in presenting the more common problems of midwifery in an organized, concise and lucid manner. This edition is offered so that the newer developments in midwifery, such as the recognition of afibrinogenæmia, radiation hazards, and hyaline membrane formation, may be included.

The text, while intended primarily for the general practitioner, is yet an excellent and very acceptable review for the specialist. The easy style and direct approach make this a delightful book to read, and in each of the 29 chapters the topics are treated in a concise, clear and easily understood manner. It is difficult to single out any particular chapter of special merit because of the general excellence. However, the reviewer did find the discussions of infections, the use and misuse of antibiotics, and prematurity of particular interest. The subject of postmaturity, so current in British literature, is presented quite completely. The author, unlike some of his colleagues, adopts a conservative, common-sense approach in the management of this condition and cautions against hasty action.

The book is adequately illustrated with x-ray photographs, photomicrographs and graphs, well chosen to amplify the text, particularly so in the chapter on disproportion.

In summary, the reviewer found this book a most enjoyable and informative treatise, obviously written by one who knows his subject so thoroughly that he has culled out "the dreary irrelevance" and presented the meat of the matter in a very digestible way. It is recommended unreservedly.

DDT, THE INSECTICIDE DICHLORODIPHENYLTRICHLOROETHANE AND ITS SIGNIFICANCE. Edited by Paul Mueller. Vol. II, Human and Veterinary Medicine. Edited by S. W. Simmons. 570 pp. Illust. Birkhäuser Verlag, Basel and Stuttgart, 1959. Swiss fr. 66.-

It is surprising that after nearly two decades of experience the exact physiological action of DDT is still unknown. Its metabolism both in the insect and in the human body is but little understood. This volume, one of three dealing with DDT, presents an exhaustive compilation of material. The first chapter by W. J. Hayes Jr. covers pharmacology and toxicology, the second by S. W. Simmons its uses in human medicine, and the third by E. F. Knipling its uses in veterinary medicine. All three authors are expert in their field.

The discovery and use of DDT insecticide has been ranked as one of the most important public health and agricultural achievements; its benefit to human medicine has been compared to that from the chemotherapeutic agents and the antibiotics. Although an increasing number of insects have become resistant to DDT, it is still the most commonly employed insecticide at the present time. It was the forerunner of the chlorinated hydrocarbon insecticides. For these reasons this series on DDT is justified.

The chapter by Hayes is of special interest to the medical profession, particularly as reference material for those members engaged in pharmacology and toxicology. It is of general interest to the clinician. All available case reports of poisoning are reviewed in this chapter. The second chapter deals with the uses of DDT in human medicine, much space being devoted to various international programs for control of vector-borne disease of public health importance. In so complete a work it seems unusual that no mention can be found of the use of DDT shampoo for treatment of head lice, although the uses of dust and ointment for human application are thoroughly covered. The third chapter is of special interest to those engaged in veterinary medicine.

The book is well written. The printing and illustrations are good. It should serve as a useful reference book. The lack of an index, however, is a serious omission and detracts somewhat from its value for ready reference. For example, should questions arise on the relationship of purpura to DDT exposure or to its possible carcinogenic effects in experimental animals, it would be necessary to read through considerable material.

This volume would be a valuable addition to the medical library, to the scientific library of certain governmental and educational institutions, and to specialists engaged in toxicology and research with insecticides.

LEHRBUCH DER HAUT- UND GESCHLECHTSKRANKHEITEN (Textbook of Skin and Venereal Diseases). Dr. Walther Schoenfeld, Professor and Head of University and Polyclinic for Skin and Venereal Diseases, Heidelberg, Germany. 546 pp. Illust. 8th ed. Georg Thieme Verlag, Stuttgart; Intercontinental Medical Book Corporation, New York, 1959. D.M. 49.50.

This new edition of a well-known textbook adds new chapters on varicose veins and includes some newer therapeutic procedures. The author succeeds in compressing an astonishing wealth of material into the 531 pages of this text. A large number of skin diseases, including many rare entities and tropical diseases, are briefly but adequately dealt with. In addition, a short description of many skin reactions and responses occurring with systemic infections and metabolic disorders is included. The organization of the material is excellent and the clinical description is admirably done. A large number of very good black-and-white photographs enhance the value of the book. The paper and the print are remarkably good.

While this book has been a favourite textbook of German undergraduate students, it would hardly be popular with the North American student, even if a translation were available. The all-inclusiveness would tend to be confusing to a student taught by case demonstration of the common conditions rather than by a prolonged series of formal lectures. The absence of bibliographic references, on the other hand, renders such a textbook less valuable for the advanced student.

The chapter on venereology appears to be somewhat old-fashioned, emphasizing discoursive descriptions of clinical minutiæ but containing hardly any discussion of the epidemiology and prevention of these diseases. The therapeutic methods mentioned include such obsolete features as mercurial therapy of syphilis. Little reference is made to the recommendations and findings of the more recent large-scale statistical surveys.

Throughout the book, one finds scholarly historical notes which contribute to its readability.

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THE CANADIAN MEDICAL ASSOCIATION

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The Canadian Medical Association,
150 St. George Street,
Toronto 5, Ontario

(Continued from page 973)

THE TREATMENT AND PREVENTION OF READING PROBLEMS. Carl H. Delacato. 122 pp. Illust. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1959. $5.00.

This book expounds the author's theory that in many instances reading problems in children arise through mixed dominance, or lack of clear-cut, one-sided cortical organization and dominance. He feels that the matter of the dominant eye, the best eye, the dominant hand and the dominant foot must be taken into consideration. Where there is mixed dominance or, as the author puts it, confused cortical organization, treatment is to endeavour to teach the child dominance for the hand, foot and eye of one side. A number of case histories are given, to show that when this was done the reading difficulty cleared.

The author is a good advocate. The book is well written and easy to understand. It can be recommended for all who are interested in this problem.

POSTURAL DRAINAGE AND RESPIRATORY CONTROL. E. Winnifred Thacker. 62 pp. Illust. 2nd ed. Lloyd-Luke (Medical Books) Ltd., London, 1959. 10s. 6d.

The second edition of this book is a small volume of 62 pages. A discussion of the anatomy and physiology of the respiratory system is followed by an excellent chapter on the technique of postural drainage. Special problems, such as application of the method in young children and the aged, and preoperative and postoperative treatment are considered. This book can be highly recommended to those interested in the subject, for it is an excellent monograph and is well illustrated with diagrams and photographs.

VOCATIONAL REHABILITATION FOR THE PHYSICALLY HANDICAPPED. Louise M. Neuschutz. 136 pp. Illust. Charles C Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1959. $6.25.

In the preface the author states that her book is intended as an aid to the physically handicapped, including the home-bound and their families, as well as to employers, personnel managers and welfare workers. This would seem to be a fair evaluation. It certainly contains nothing new or thought-provoking for medical practitioners or others who are face to face with the problems of the handicapped.

It is rather strange that, having reviewed the book, one is unable to identify the profession of the author or the field in which she has worked.

SCIENCE STUDENTS' GUIDE TO THE GERMAN LANGUAGE. A. F. Cunningham. 186 pp. Oxford University Press, London and Toronto, 1958. $2.00.

After a temporary eclipse, the German language has again come into the forefront as a means of scientific communication. The present work represents the teaching method used by Miss Cunningham in the University of Birmingham for imparting a reading knowledge of German to scientists. The first part of the book contains an outline of German grammar with pieces for translation from books on chemistry and physics. The second part consists of a series of passages for translation. There is no accompanying vocabulary, so that the student will need a dictionary for this work. Biologists should note that the only part of biology directly covered in these readings is bacteriology.

LEHRBUCH DER KRANKENGYMNASTIK (Textbook of Medical Gymnastics). K. Lindemann, H. Teirich-Leube, W. Heipertz and others. Vol. 1 of 4 volumes. 328 pp. Illust. Georg Thieme Verlag, Stuttgart, Germany; Intercontinental Medical Book Corporation, New York, 1959. $7.60.

It is the intention of the authors to produce a comprehensive textbook on remedial gymnastics and massage, of particular use for reference by physiotherapists. The first volume deals with general principles, containing sufficient discussion of physiology, a general account of the causes of disease, a brief chapter on the history of remedial exercises, detailed description of their bases and basic techniques, and chapters on movement therapy in water and on massage. Into the middle of this material has been sandwiched a short chapter on first aid and bandaging.

FORTHCOMING MEETINGS

CANADA

COLLEGE OF GENERAL PRACTICE OF CANADA, Fourth Annual Scientific Assembly, Montreal, Que. (Dr. W. V. Johnston, Executive Director, 176 St. George Street, Toronto 5, Ont.) February 29-March 3, 1960.

SECTION OF GENERAL PRACTICE, B.C. DIVISION, CANADIAN MEDICAL ASSOCIATION, Eighth Annual Scientific Session, Harrison Hot Springs Hotel, Harrison, B.C. (In charge of registration: Dr. R. A. White, Oliver, B.C.) March 30-April 2, 1960.

ONTARIO MEDICAL ASSOCIATION, 80th Annual Meeting, Toronto, Ont. (Dr. Glenn Sawyer, General Secretary, 244 St. George Street, Toronto 5, Ont.) May 9-13, 1960.

CANADIAN PUBLIC HEALTH ASSOCIATION, 48th Annual Meeting, Halifax, N.S. (Dr. G. W. O. Moss, Honorary Secretary, 150 College Street, Toronto 5, Ont.) May 31-June 2, 1960.

CANADIAN FEDERATION OF BIOLOGICAL SOCIETIES (comprising the Canadian Physiological Society, the Pharmacological Society of Canada, the Canadian Association of Anatomists and the Canadian Biochemical Society), Third Annual Meeting, Winnipeg, Man. (Dr. E. H. Bensley, Honorary Secretary, Montreal General Hospital, 1650 Cedar Ave., Montreal 25, Que.) June 8-10, 1960.

CANADIAN MEDICAL ASSOCIATION, 93rd Annual Meeting, Banff, Alberta. (Dr. A. D. Kelly, General Secretary, C.M.A. House, 150 St. George Street, Toronto 5, Ont.) June 13-17, 1960.

UNITED STATES

AMERICAN COLLEGE OF ALLERGISTS, Graduate Instructional Course and Annual Congress, Americana Hotel, Bal Harbor, Miami Beach, Florida. (Dr. John D. Gillaspie, Treasurer, 2049 Broadway, Boulder, Colorado.) February 28-March 4, 1960.

7TH INTERNATIONAL ANATOMICAL CONGRESS, New York. (Dr. D. W. Fawcett, Executive Secretary, Department of Anatomy, Cornell University Medical College, 1300 York Ave., New York 21, N.Y.) April 11-16, 1960.

OTHER COUNTRIES

SECOND BAHAMAS SURGICAL CONFERENCE, British Colonial Hotel, Nassau, Bahamas. (Dr. B. L. Frank, Organizing Physician, Bahamas Conferences, P.O. Box 4037, Fort Lauderdale, Florida.) December 28, 1959-January 16, 1960.

VI PAN-AMERICAN CONGRESS OF OPHTHALMOLOGY, Caracas, Venezuela. (Dr. R. G. C. Kelly, 90 St. Clair Ave. West, Toronto 7, Ont., Assistant Secretary.) January 31-February 7, 1960.

SECOND BAHAMAS SERENDIPITY CONFERENCE, British Colonial Hotel, Nassau, Bahamas. (Dr. B. L. Frank, Organizing Physician, Bahamas Conferences, P.O. Box 4037, Fort Lauderdale, Florida.) January 17-30, 1960.

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FESTIVAL INTERNATIONAL PERMANENT DU FILM MEDICO-CHIRURGICAL ET SCIENTIFIQUE

L'ouverture de la 7ième session du *Festival International Permanent du Film Médico-Chirurgical et Scientifique,* organisé en collaboration avec *La Gazette Médicale de France* par *l'Association Nationale des Médecins Cinéastes et des Cinéastes Scientifiques de France,* aura lieu à la Faculté de Médecine de Paris, le 17 février 1960.

Les réalisateurs de films médico-chirurgicaux ou scientifiques de format 16 mm. substandard exclusivement, inédits en France, désirant participer à cette importante manifestation internationale, devront adresser leurs œuvres avant le *5 décembre prochain,* date de réunion du Conseil Technique chargé de la sélection des films inscrits.

Tous les envois doivent être effectués à l'adresse de *l'Association Nationale des Médecins Cinéastes et des Cinéastes Scientifiques de France,* 23, bld de Latour-Maubour, Paris 7e. Les participants étrangers ont intérêt à faire acheminer leur envoi par le canal de l'Attaché culturel de leur Ambassade à Paris, via leur Ministère des Affaires Etrangères.

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POSTGRADUATE COURSES, AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians is continuing its autumn-winter postgraduate courses with Postgraduate Course No. 4, Clinical Cardiology, given at Tulane University School of Medicine, New Orleans, November 30-December 4, 1959. The other courses of the 1959-1960 session are: Course No. 5, Current Concepts of the Rheumatic Diseases—Their Recognition and Management, to be given January 11-15, 1960, at Cornell University Medical College and The Hospital for Special Surgery; Course No. 6, Internal Medicine, January 25-29, Henry Ford Hospital, Detroit, Mich.; and Course No. 7, Recent Advances in Metabolic Diseases, February 8-12, The Mount Sinai Hospital, New York City. The fee for each of the courses is $60 for A.C.P. members and $80 for non-members. Registration must be made through the Executive Offices of the American College of Physicians, 4200 Pine Street, Philadelphia 4, Pa.

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COURSE ON PHYSICAL MEDICINE AND REHABILITATION

The University of Buffalo School of Medicine announces a course on physical medicine and rehabilitation in clinical practice to be held on Wednesday and Thursday, December 2 and 3, 1959. This course will include care of the hemiplegic and the patient with peripheral vascular disease, rehabilitation of the arthritic and the amputee, and physical medicine in the approach to backache and the painful shoulder. The fee for the course is $30.00. Further information from the Department of Postgraduate Education, University of Buffalo School of Medicine, 3435 Main Street, Buffalo 14, New York.

TV IN MEDICAL EDUCATION

At the October 15 and 16 meeting of the Council on Medical Television, Institute for Advancement of Medical Communication, one of the three keynote speakers was Arthur S. Flemming, Secretary, Department of Health, Education and Welfare. A closed-circuit TV link transmitted Secretary Flemming's address from his Washington office to the Clinical Center at the National Institutes of Health in Bethesda, Maryland, where the Council was assembled. Other keynote speakers were Edward Stanley, Director of Public Affairs for the National Broadcasting Company, and C. R. Carpenter, Ph.D., Professor of Psychology and Director of Academic Research and Services, Pennsylvania State University. The chief subject for this meeting of the Council, an advisory and planning body under the auspices of the Institute for Advancement of Medical Communication, was the use of television in postgraduate medical education.

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symposium on food poisoning, presented by Dr. Lionel E. Elkerton and his associates in the Division of Laboratories of the Ontario Department of Health; and a paper, "What the medical officer of health should know about meat inspection", by Dr. L. W. Macpherson, Associate Professor of Microbiology, School of Hygiene.

The program for the second day, Wednesday, February 9, will deal mainly with environmental problems and will be under the chairmanship of Dr. N. Gordon Brown, Deputy Minister of Health, Province of Ontario. The topics for the morning session will be "Physiological problems of hygiene, public health and occupation" (Dr. John R. Brown, Professor of Physiological Hygiene, School of Hygiene) and "Recent advances in infectious diseases" (Drs. Donald M. McLean and Harry W. Bain, Hospital for Sick Children). At the afternoon session, current problems in water pollution, sewage and sanitation, with special reference to rural areas, will be discussed by Dr. A. E. Berry, Chairman of the Ontario Water Resources Commission, and his associates.

Administration will be the subject of the final day's program. The morning session will consist of a symposium on "The physician": "The physician as administrator, seen by himself" (Dr. H. R. Leavell, Professor of Public Health Practice, Harvard School of Public Health); "The physician as seen by a sociologist" (Dr. Oswald Hall, Professor of Political Economy, University of Toronto); and "The physician as seen by a political economist" (Dr. Malcolm G. Taylor, Associate Professor of Political Economy, University of Toronto). In the afternoon there will be a discussion period, followed by a paper on "Job analysis of nursing personnel" by Mr. C. H. Walker of the Research Division, Department of National Health and Welfare, Ottawa.

The fee for the course will be $35.00 (Canadian funds). Application should be made to the Division of Postgraduate Medical Education, Faculty of Medicine, University of Toronto, by December 1. (Application to attend part of the course will be considered.) Fees should be made payable to the Chief Ac-

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REFRESHER COURSE IN PUBLIC HEALTH AND PREVENTIVE MEDICINE

The Third Annual Refresher Course in Public Health and Preventive Medicine, conducted by the School of Hygiene, University of Toronto, will be held on February 8, 9 and 10, 1960. The first day, Monday, February 8, will be given over to a discussion of the subject of infections, under the joint chairmanship of Dean J. A. MacFarlane and Dr. Ian Macdonald. The morning session will be concerned with hospital infections: the general bacteriology of present-day hospital infections (Dr. E. G. D. Murray, Chairman, Associate Committee on Hospital Infections, National Research Council of Canada); the specific problem of staphylococcal infections in hospitals and suggestions for control (Dr. D. Hugh Starkey, Consultant in Pathology and Bacteriology, Queen Mary Veterans Hospital, Montreal); and the problem of disinfectants (speaker to be announced). The afternoon session will consist of a

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countant, University of Toronto, and sent to the Division of Postgraduate Medical Education on application or before January 31, 1960.

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COURSE ON CANCER

The University of Buffalo School of Medicine announces a one-day course on December 10 on the diagnosis and management of malignant diseases for the general practitioner. Special attention will be given to complications of malignancy, cytological diagnosis, chemotherapy and reports of current research. Registrants will be able to examine individual patients with instructors. The fee is $15. Inquiries to Department of Postgraduate Education, University of Buffalo School of Medicine, 3435 Main Street, Buffalo 14, New York.

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PUBLIC HEALTH REFERENCES

The epidemiology division of the Department of National Health and Welfare has recently issued a bibliography of *Selected Canadian Public Health References of Epidemiological Significance.* This constitutes Supplement No. 1 to their first list and covers the year 1958. References are broadly classified under the headings of accidents, Arctic medicine, chronic diseases, communicable diseases, and public health services. There is an index of authors.

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GASTRO-INTESTINAL BLEEDING WITH RESERPINE THERAPY

The crystalline alkaloid of *Rauwolfia serpentina* is responsible for several side effects associated with its therapeutic use. One of them which has already been referred to on a number of occasions is acute upper gastro-intestinal hæmorrhage in the presence or in the absence of previous ulcer history. Added to previous reports on this topic is that of Duncan and Fleeson of Minneapolis (*J. A. M. A.*, 170: 1661, 1959), who describe the case of a 58-year-old man with Huntington's chorea and mental deterioration. In order to decrease his involuntary movements the treatment with reserpine was begun according to the schedule outlined by Lazarte and co-workers; 5 mg. of reserpine was given intravenously in the afternoon and 2 mg. by mouth in the evening. The next morning the patient awoke with epigastric pain and in the course of three hours vomited 500 to 600 ml. of material containing a large amount of fresh and altered blood. A small hiatal hernia was discovered on barium meal examination performed three days later, but no ulceration could be seen. The coagulogram was normal except for a slightly prolonged prothrombin time. The authors consider that stimulation of gastric secretion may be an important factor in the ability of reserpine to produce ulceration of the stomach and duodenal mucosa. It is known that in man 1 mg. of reserpine given intravenously will produce a marked hyperchlorhydria starting 30 minutes after injection and per-

sisting for at least four hours. Although not frequent, this complication should be kept in mind when prescribing reserpine.

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BRAIN STEM DAMAGE AND NECK MANIPULATION

Extension of the neck and turning the chin to one side severely compromises the circulation through the opposite vertebral artery, and manipulation of the neck can produce vascular accidents on this basis. Two such cases are reported by Green and Joynt (*J. A. M. A.*, 170: 522, 1959) and their unusual features described. The first patient, a woman aged 31, with the tentative diagnosis of multiple sclerosis developed dizziness, vomiting and loss of power in the left arm and leg immediately after vigorous manipulation of the neck. This was superimposed on her underlying disease which was indeed multiple sclerosis. The second case was that of a man aged 55 who had been given chiropractic treatment two weeks before and who a half hour after treatment staggered on attempting to walk and was unable to place his right leg properly. The right arm became numb the following day, and after a second treatment his whole right side became insensitive to pain and he was unable to distinguish temperature changes. On examination, he had Horner's syndrome on the left with facial weakness, deviation of the palate, paralysis of the left vocal cord, weakness of the right arm and leg, diminished pain and temperature sensation over the right half of the body and some slight hypalgesia and hypasthæsia of the right forehead. In addition he had pallæsthesia, i.e. on touching the right side of the chest he felt a lightning-like sensation at a similar spot on the left side.

Considering the frequency with which manipulation of the neck is carried out, the authors wonder at the rarity of such accidents. They believe that in the affected cases, manipulation is either unusually violent or the bony structures near the vertebral arteries are either congenitally or degeneratively abnormal. In other cases there may be underlying vascular disease or an abnormal vascular pattern.

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DIURETIC EFFECTS OF HYDROCHLOROTHIAZIDE

Hydrochlorothiazide, a derivative of chlorothiazide, was tested by Sackner, Wallack and Bellet (*Am. J. M. Sc.*, 237: 575, 1959) for its diuretic effectiveness in patients with congestive heart failure, cirrhosis, chronic renal disease and hypertension. It was found to be a potent oral diuretic, particularly in patients with congestive heart failure, but of limited value in patients with cirrhosis and renal disease. Chloride was excreted in considerable amounts with sodium and potassium in varying proportions. The most important untoward effect was the development of hypokalæmia secondary to increased potassium excretion. This was particularly marked in patients with liver disease. The authors thought that hydrochlorothiazide was comparable to chlorothiazide in diuretic effectiveness.

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INTERNAL MAMMARY ARTERY LIGATION FOR ANGINA

Seventeen patients with angina pectoris believed to be due to coronary-artery disease participated in an experimental evaluation of internal mammary artery ligation by Cobb *et al.* (*New England J. Med.*, 260: 1115, 1959). Eight patients had their internal mammary arteries ligated but the other nine had skin incisions only. At operation the surgeon was handed a randomly selected envelope containing a card with instructions whether or not to ligate the arteries, and the physicians following up the cases postoperatively were not informed whether or not the arteries in the patient had been ligated. Postoperatively the cases were followed up for 3-15 months. The results showed that the non-ligated group had at least the same degree of improvement in exercise tolerance, decrease of number of nitroglycerin tablets taken and reversal of abnormalities of the E.C.G. during and immediately after the exercise as did the ligated group.

The estimated subjective improvement in the ligated group was 32% and in the non-ligated group 43%. Three of the patients who underwent ligation and two who did not reported no improvement. The conclusions are that this procedure probably has no effect on the pathophysiology of coronary-artery disease, and that the benefits from this operation are more likely to be psychological. The question is raised how much of the reported clinical improvement after thoracotomy for other procedures designed to improve coronary circulation is due to the patient's psychological reaction to surgery rather than to greater coronary artery blood flow.

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ETHICAL STANDARDS FOR THE U.S. HEARING AID INDUSTRY

Medical practitioners who in the past have been somewhat disturbed at the uneven quality of hearing aids will be glad to know that the Hearing Aid Industry Conference which took place recently in the United States has now set rigid standards of ethical practice in the hearing aid field. This code was voluntarily adopted and released by the association on September 30. The industry is asking for the co-operation of local better business bureaux and newspapers and other advertising media to assist by not accepting advertisements which violate the code.

The new code is designed to get rid of all advertising, promotion and selling practices which might tend to mislead the customer or prevent him from getting the aid most suited to his needs. Practices prohibited by the code include dishonest advertising, such as advertising that a hearing aid has no cord, buttons or receivers in either ear without disclosing it is simply a bone conduction instrument, helpful only to a minority of the deaf. Other matters prohibited include: (1) showing a portion of a hearing aid in an advertisement in

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such a way as to imply that it is the entire instrument; (2) fee-splitting or "kickbacks" to members of the medical profession in payment for their referral of patients; (3) advertising such remedies as medicines, ear oils, drugs and vitamins, rehabilitation by machine, vibrations, sound treatment or surgery. This includes a statement that medicine and surgery are the province of the physician and should not be offered in any way by any member of the industry; (4) representing that medical services have been used to design or make a product or will be available in selecting, testing or adjusting the product to the needs of the purchaser, when this is not a fact; (5) use of such terms as "specialist", "clinic", "Hearing Center", "Institute" and the like to suggest they refer to the medical profession or educational and research institutions; (6) false claims that an invention or a mechanical or scientific principle is new; (7) advertising that an individual, organization or institution endorses, uses or recommends a product when this is not the fact; (8) claims that an instrument has been tested, accepted or approved by any individual, concern, etc., when these are misleading.

ANIMAL CARE PANEL

The Animal Care Panel held its 10th annual meeting at the Sheraton-Park Hotel in Washington, D.C., on October 29-31. There were six sessions at the three-day meeting, dealing with genetics, housing and management of laboratory animals, nutrition, equipment, technique and facilities, germ-free and specific pathogen-free animals, and diseases of laboratory animals. Papers presented at the annual convention will later appear in the quarterly publication of the Animal Care Panel, *Proceedings of the Animal Care Panel.*

SURGICAL TREATMENT OF VENTRICULAR SEPTAL DEFECT

Surgical repair of ventricular septal defect is now an established procedure, with a pump oxygenator for temporary cardiopulmonary bypass. Out of a collected series of 345 patients undergoing operation during bypass for a variety of congenital and acquired cardiovascular lesions, 130 had isolated ventricular septal defect. From this experience, Cooley (*Dis. Chest*, 35: 651, 1959) suggests that ventricular defects are the most common congenital cardiac defects requiring open heart surgery.

Results were highly satisfactory among those between the ages of 2 and 15 years; among 71 patients in this age group there were five deaths. Risk of operation during infancy is substantially higher, but a salvage rate of 70% of patients under 2 years of age justifies operation even in these critically ill patients.

Pulmonary hypertension is frequently associated with ventricular septal defect. As pulmonary vascular resistance increases in these patients, reversal of the intracardiac shunt may lead to cyanosis. The extent of pulmonary vascular changes influences the risk of

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THE PARENT SCHOOL ORGANIZATION FOR EXCEPTIONAL CHILDREN OF THE PROVINCIAL TRAINING SCHOOL AT RED DEER, HAVE INAUGURATED AN ANNUAL AWARD OF THREE PRIZES OF $100.00 EACH, TO PERSONS WHO HAVE DONE ORIGINAL RESEARCH IN THE FIELD OF MENTAL DEFICIENCY.

This may be in the field of:

Medicine	**Psychiatry**
Psychology	**Education**
Genetics	**Eugenics**

This work should have been done within the past twelve months and manuscripts or reprints of publications will be accepted from professionally qualified people in these various fields. These manuscripts should be submitted in six copies to the Chairman, Research Committee, Parent School Organization for Exceptional Children, Box 580, Red Deer, Alberta, Canada, not later than July 31st, 1960. The winners of the awards will be announced at a later date.

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operation. Although patients with a so-called Eisenmenger's complex associated with cyanosis, clubbed nails, polycythæmia and right ventricular hypertrophy are not satisfactory candidates for surgical treatment, the authors have operated successfully upon a number of patients with balanced or combined left-to-right and right-to-left shunts. Future developments may help control the physiological effects of the increased pulmonary vascular resistance and thus make possible operative correction in almost all patients with ventricular septal defects.

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DERMATOMYOSITIS AND MALIGNANCY

Williams (*Ann. Int. Med.*, 50: 1174, 1959) reviews 92 cases of dermatomyositis associated with malignancy, with emphasis on the similarities of their clinical pictures. Acute onset of skin rash and muscle complaints progressing to dermatomyositis in a patient of middle age may presage malignancy. Most common sites for associated neoplasms were: stomach, breast, ovaries, lung, reticuloendothelial system, gall-bladder, colon and rectum, and kidney, in that order. The incidence of malignancy in dermatomyositis cases reported to date is 15%. Therapy directed at associated neoplasm may provide a dramatic temporary remission in dermatomyositis.

Whatever the exact relationship between malignancy and dermatomyositis, whether cause-and-effect or merely coincidence, the symptom complex of acute onset with predominant skin involvement of face, hands, arms and neck in a patient of middle age should make the clinician undertake a careful search for occult tumour.

—

ROYAL COLLEGE OF PHYSICIANS GETS £450,000 GRANT

The Royal College of Physicians, London, which has between 200 and 300 Members and Fellows in Canada and some one hundred in the U.S.A., has received the greatest single benefaction in its nearly 450 years of history—the grant of £450,000 from the Isaac Wolfson Foundation to build a new college.

The building will be erected in Regent's Park and will enable the college to expand its activities and develop new enterprises. Overseas members will also benefit when in London by being offered better facilities and it will be possible to increase the number of Fellows and Members attending courses and conferences. The present college in the heart of London, at the corner of Pall Mall East and Trafalgar Square, was built in 1825 when there were 90 Fellows. Now there are 900 Fellows and about 4000 Members.

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SOLITARY PULMONARY NODULES FOUND IN A ROENTGENOGRAPHIC SURVEY

In 1949, a mass chest roentgenographic survey was conducted, during which 673,218 screening

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The history of anaesthesia

PART II

From Humphrey Davy to Crawford Long

Of the millions of operations performed on this continent each year, some are certain to result in death. But every year the risk decreases as new cures, medicines, treatments are discovered; as improved equipment provides more safety in surgery. How do our yearly successes rate with those of the early nineteenth century? In this era the pioneers of medicine and anæsthesia were engaged in daily conflict against unknown elements.

With the fabrication of the first "gas machine" in 1799, Humphrey Davy opened up new vistas for experimentation. The dangers were many when dealing with these unknown gases. In an article published in 1818, Michael Faraday warns:

"It is necessary to use caution in making experiments of this kind. By the imprudent inspiration of ether, a gentleman was thrown into a very lethargic state, which continued with occasional periods of intermission for more than 30 hours, and a great depression of spirits; for many days the pulse was so much lowered that considerable fears were entertained for his life."

However the results were not always detrimental. In the United States many itinerant "professors" of chemistry demonstrated the exhilarating effects of nitrous oxide —with audience participation. The young volunteers became pleasantly drunk, lost their sense of equilibrium, talked foolishly and sometimes laughed with complete abandon. Soon the audiences amused themselves without accompanying lectures, indulging in "Laughing-gas parties" and "Ether frolics".

The lighter side of these experiments soon reaped important results. In 1842, William E. Clarke, a young student of chemistry who often arranged "ether entertainment" for his companions, administered ether from a towel to a young woman called Miss Hobbie . . . one of her teeth was then extracted without pain by a dentist, Dr. Elijah Pope. This would appear to be the first use of anæsthesia on record.

It was only two months after this outstanding success in the science of anæsthesia that a young physician, Crawford W. Long of Jefferson, Georgia, performed an operation to remove a tumor in the neck. His patient, James M. Venable, was under the influence of ether. The operation was completely successful with the patient feeling neither the surgeon's knife nor any pain.

Crawford Long's successful experimentation with ether was another milestone on the road to today's high standards of anæsthetic procedure and equipment. The years following were crowded with discoveries in this field, but most important in our eyes was the fabrication of Dr. Boyle's anæsthetic apparatus in 1917. The machine was close to perfection. So close that today, British Oxygen Canada has retained the original design, only modernizing and modifying it to a small extent. This is the B.O.C. Boyle machine now recognized by anæsthetists as the finest equipment of its kind in the world. It, together with other anæsthetic equipment and attachments, anæsthetic sundries, medical gases and *dependable service*, makes good the boast of fine quality in all British Oxygen Company products.

For descriptive literature, write or telephone, British Oxygen Canada Limited, Medical Division, 355 Horner Avenue, Toronto 14, Ontario.

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films were taken, representing a coverage of almost 65% of the adult population of the area. In 1954, the records and films of persons with abnormal findings were reviewed. From this group, 666 persons whose lesions met certain predetermined criteria were classified as having solitary pulmonary nodules and were selected by Holin *et al.* (*Am. Rev. Tuberc.*, 79: 427, 1959) for a five-year follow-up study. All but 22 persons were traced. The over-all prevalence of solitary pulmonary nodules was one per 1000 persons examined roentgenographically. Nodules were observed more frequently among older persons, males, and whites.

The etiology had been established for only 13.8% of the study group. Only 3% of the nodules were proved to be malignant, and 9% were diagnosed as tuberculous. The larger nodules were much more frequently malignant than were the smaller nodules. No nodules with demonstrable calcification were found to be malignant.

Of the entire study group, 80.5% of the subjects were alive and had had no symptoms attributable to the nodule during a five-year period following the original survey. Only 2.6% of the study group had died of causes related to the nodule, all of the deaths being attributed to pulmonary malignancy. In all, 61 deaths were observed, whereas 52 would have been expected on the basis of the mortality experience. The excess mortality was entirely attributable to pulmonary malignancy.

Evidence is presented to show that the proportion of malignant lesions among a group of persons with solitary pulmonary nodules will vary markedly according to the factors used in selecting the study group. While the proportion of malignant lesions in the total study group was only 3%, it was 35% among males of 45 and older whose nodules showed no evidence of calcification, were poorly circumscribed and measured 40 mm. or more in diameter. It is concluded that the decision for surgical removal of solitary pulmonary nodules must be a highly individual one in each case.

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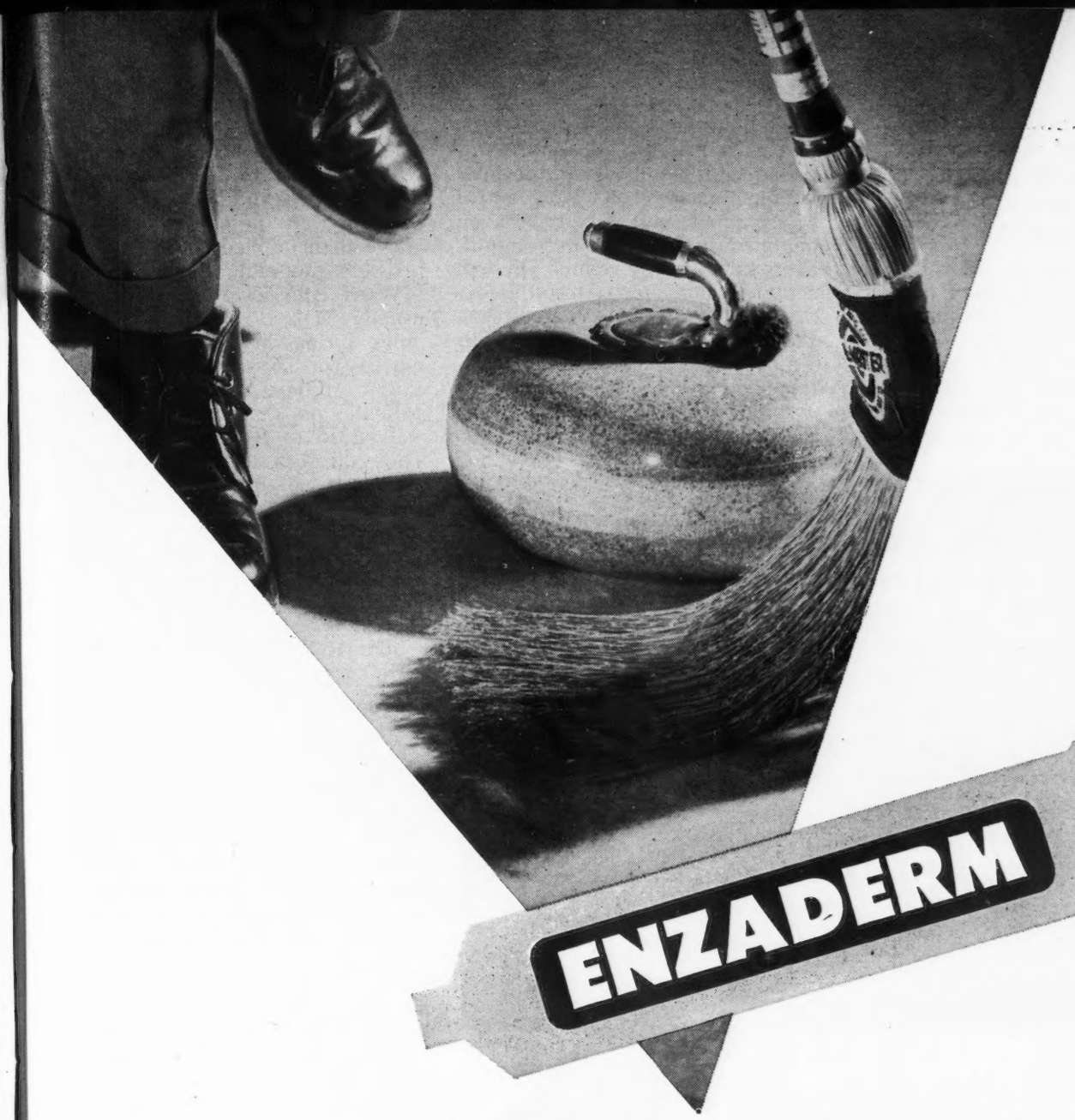

Cleaning the Way for Action

Wound healing progresses more rapidly when hindrances are removed. Necrotic tissue, debris and pus hinder the action of topical antibiotics by making the bacterial flora inaccessible to their effects.

The removal of these obstacles by proteolytic enzymes removes the nutrient medium of pathogenic organisms without interfering with the healing process of living tissue.

ENZADERM provides "chemical debridement" plus safe topical antibiotic therapy acting on both gram positive and gram negative organisms.

ENZADERM is indicated in all lesions of the skin attended by necrotic tissue and infection.

ENZADERM Ointment*

Available in 15 Gm. Tubes (½ ounce tubes).

Trypsin	5000 Units	Bacitracin	500 Units
Chymotrypsin	5000 Units	Polymyxin-B	5000 Units

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ACTIVITY OF AMBULATORY TUBERCULOUS PATIENTS IN HOSPITAL

While prolonged bed rest is no longer deemed necessary in every case of tuberculosis, few physicians advocate unlimited activity throughout the period of therapy. However, most physicians, although possessing a healthy respect for tuberculosis, are continuously extending the activity of patients and as a rule are pleasantly surprised with results. Two questions remain unanswered. How active is a patient with tuberculosis on modified bed rest? Can tranquillizers satisfactorily reduce physical activity when such a result is desired? To answer these questions, Walsh *et al.* (*Am. Rev. Tuberc.*, 79: 531, 1959) measured the ambulatory activity of 10 patients, in hospital with active pulmonary tuberculosis, with pedometers. Administration of a tranquillizing agent (reserpine) was associated with a moderate decrease in activity in three of the patients. All patients were noted to be more active than implied by a modified bed-rest program.

Ward physicians and nurses usually walked only 2.5 to 3.5 miles during an eight-hour working day, or 3.5 to 5.0 miles during a 24-hour day. Yet some of these patients on "restricted activity" walked 16 to 19 miles per week. Thus, on occasion the amount of measured activity of the patients exceeded that of the professional staff. These findings were unexpected and suggest re-evaluation of some current concepts.

SEGMENTAL ATELECTASIS IN CHILDREN WITH PRIMARY TUBERCULOSIS

A paper by Frostad (*Am. Rev. Tuberc.*, 79: 597, 1959) emphasizes the great frequency of serious bronchoscopic findings in a series of 90 children with segmental atelectasis after primary tuberculosis. Bronchial stenosis relating to lymph node impression was present in 67.8%, and lymph node perforation of the bronchial tree in 27.8%. In only one child were the findings completely negative at bronchoscopic examination. Both the atelectasis and the complications, such as lymph node perforation, were commoner on the right side.

Lymph node perforation was commoner in pre-school children and in boys than in girls. Lymph node perforations in children very often appeared without symptoms (very few children had any symptoms at all), but coincident with these perforations a simultaneous clearing of the atelectatic zones was observed. This symptom not infrequently led to the correct diagnosis—the lymph node perforation—being verified at the next bronchoscopic examination. The perforation appeared in spite of antimicrobial therapy, and even 12 to 14 months of chemotherapy did not prevent a lymph node perforation.

Out of 33 of the children 27 had an abnormal bronchogram. Tuberculosis was found in 12 specimens resected from 15 children; in addition, bronchiectasis, atelectasis and lung fibrosis were found.